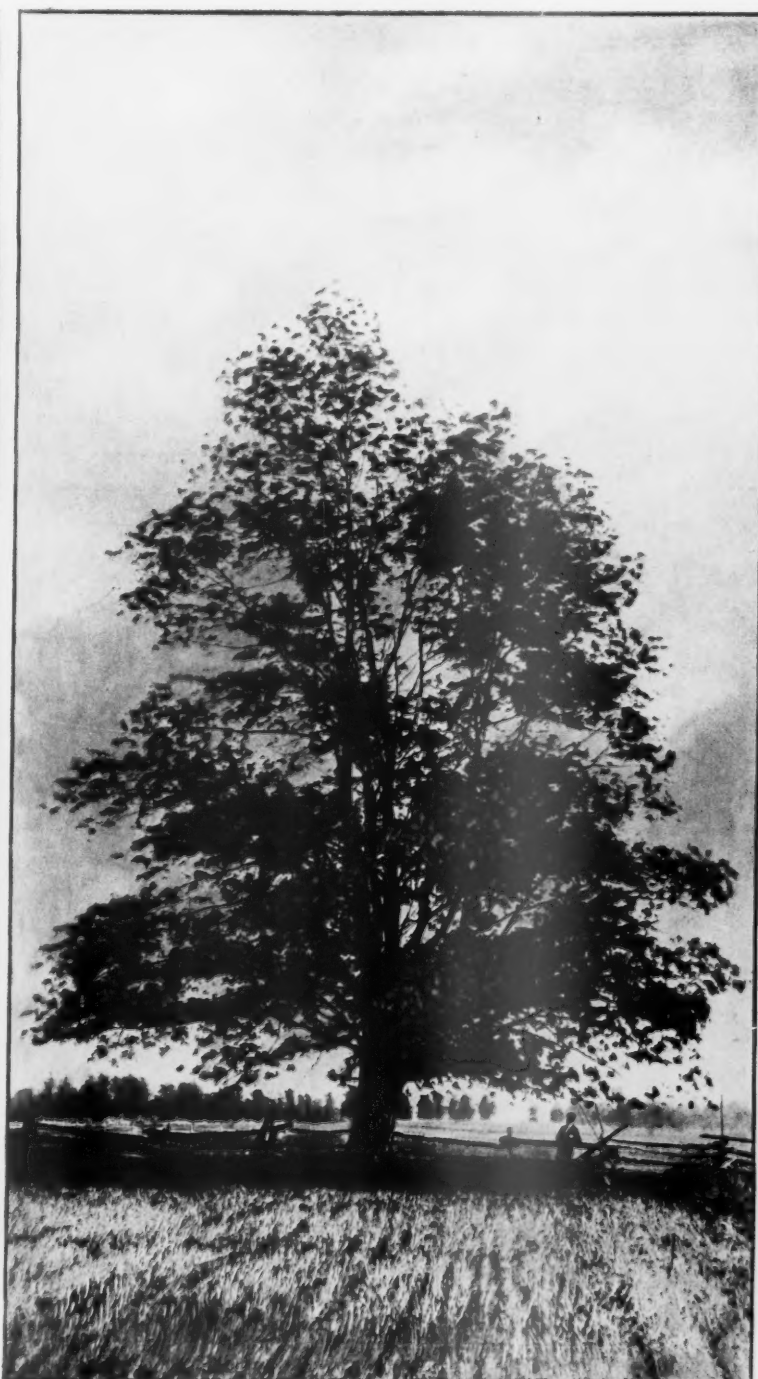
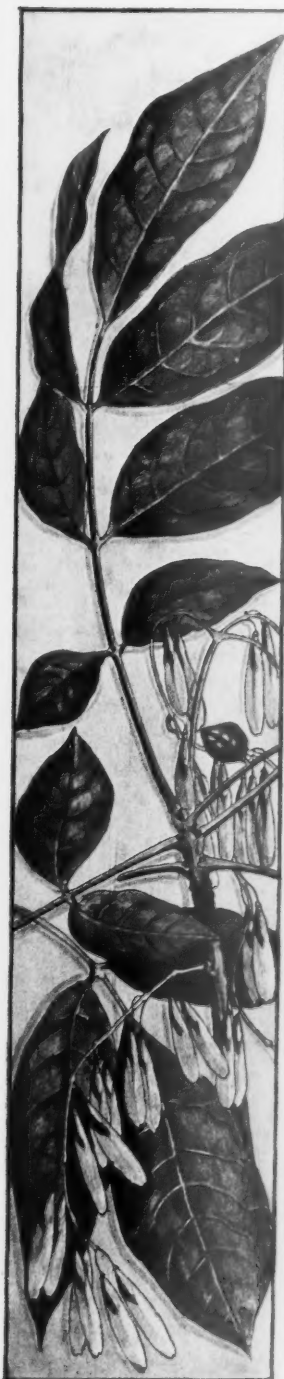


American Forestry

Vol. 21

DECEMBER, 1915

No. 264



THE WHITE ASH

The American Forestry Association

Washington, D. C.

President

DR. HENRY STURGIS DRINKER, President, Lehigh University, South Bethlehem, Pa.

Vice-Presidents

JOSHUA L. BAILY, Pennsylvania
THEODORE L. BRISTOL, Connecticut
Ex-President Connecticut Forestry Association
ANDREW CARNEGIE, New York
MRS. EMMONS CROCKER, Massachusetts
DR. CHARLES W. ELIOT, Massachusetts
President Emeritus Harvard University
DR. B. E. FERNOW, Canada
Dean of Forestry, University of Toronto
HON. WALTER L. FISHER, Chicago, Ill.
Ex-Secretary of the Interior

HENRY S. GRAVES, District of Columbia
Chief of the Forest Service
EVERITT G. GRIGGS, Washington
HON. DAVID HOUSTON
Secretary of Agriculture
HON. FRANKLIN K. LANE
Secretary of the Interior
HON. ASBURY F. LEVER, South Carolina
United States Representative
HON. THOMAS NELSON PAGE
Ambassador to Italy
HON. GEO. PARDEE, California
Ex-Governor of California

GIFFORD PINCHOT, Pennsylvania
FILIBERT ROTH, Michigan
Dean of Forestry, University of Michigan
DR. J. T. ROTHROCK, Pennsylvania
HON. WM. H. TAFT, Connecticut
Ex-President United States
JOSEPH N. TEAL, Oregon
Chairman Oregon Conservation Commission
HON. JOHN WEEKS, Massachusetts
United States Senator
DR. ROBERTS. WOODWARD, Washington, D.C.
President, Carnegie Institution.

Treasurer

JOHN E. JENKS, Editor, Army and Navy Register, Washington, D. C.

Executive Secretary

P. S. RIDSDALE, 1410 H Street, N. W., Washington, D. C.

Directors

E. T. ALLEN, Oregon
Forester, Western For. and Conservation Asso.
HON. ROBERT P. BASS, New Hampshire
Ex-Governor of New Hampshire
WM. B. GREELEY, District of Columbia
Assistant U. S. Forester
W. R. BROWN, New Hampshire
Pres. New Hamp. Forestry Commission
HERMAN H. CHAPMAN, Connecticut
Professor of Forestry, Yale Forest School

DR. HENRY S. DRINKER, Pennsylvania
President, Lehigh University
ALFRED GASKILL
State Forester, New Jersey
JOHN E. JENKS, District of Columbia
Editor, Army and Navy Register
CHESTER W. LYMAN, New York
International Paper Company
CHARLES LATHROP PACK, New Jersey
Pres. Fifth National Conservation Congress

CHARLES F. QUINCY, New York
J. E. RHODES, Illinois
Secretary, Southern Pine Association
ERNEST A. STERLING, Illinois
Forest and Timber Engineer
JOHN L. WEAVER, District of Columbia
Real Estate Broker
J. B. WHITE, Missouri
Ex-President, National Conservation Congress

Declaration of Principles and Policy of *The American Forestry Association*

IT IS A VOLUNTARY organization for the inculcation and spread of a forest policy on a scale adequate for our economic needs, and any person is eligible for membership.

IT IS INDEPENDENT, has no official connection with any Federal or State department or policy, and is devoted to a public service conducive to national prosperity.

IT ASSERTS THAT forestry means the propagation and care of forests for the production of timber as a crop; protection of watersheds; utilization of non-agricultural soil; use of forests for public recreation.

IT DECLARES THAT FORESTRY is of immense importance to the people; that the census of 1913 shows our forests annually supply over one and a quarter billion dollars' worth of products; employ 735,000 people; pay \$367,000,000 in wages; cover 550,000,000 acres unsuited for agriculture; regulate the distribution of water; prevent erosion of lands; and are essential to the beauty of the country and the health of the nation.

IT RECOGNIZES THAT forestry is an industry limited by economic conditions; that private owners should be aided and encouraged by investigations, demonstrations, and educational work, since they cannot be expected to practice forestry at a financial loss; that Federal and State governments should undertake scientific forestry upon national and State forest reserves for the benefit of the public.

IT WILL DEVOTE its influence and educational facilities to the development of public thought and knowledge along these practical lines.

It Will Support These Policies

Federal Administration and Management of national forests; adequate appropriations for their care and management; Federal cooperation with the States, especially in forest fire protection.

State Action by acquirement of forest lands; organization for fire protection; encouragement of forest planting by communal and private owners; non-political departmentally independent forest organization, with liberal appropriations for these purposes.

Forest Fire Protection by Federal, State and fire protective agencies, and its encouragement and extension, individually and by cooperation; without adequate fire protection all other measures for forest crop production will fail.

Forest Planting by Federal and State governments and long-lived corporations and acquirement of waste lands for this purpose; and also planting by private owners, where profitable, and encouragement of natural regeneration.

Forest Taxation Reforms removing unjust burdens from owners of growing timber.

Closer Utilization in logging and manufacturing without loss to owners; aid to lumbermen in achieving this.

Cutting of Mature Timber where and as the domestic market demands it, except on areas maintained for park or scenic purposes, and compensation of forest owners for loss suffered through protection of watersheds, or on behalf of any public interest.

Equal Protection to the lumber industry and to public interests in legislation affecting private timberland operations, recognizing that lumbering is as legitimate and necessary as the forests themselves.

Classification by experts of lands best suited for farming and those best suited for forestry; and liberal national and State appropriations for this work.

American Forestry

VOL. XXI

DECEMBER, 1915

No. 264

White Ash

Identification and Characteristics

By SAMUEL B. DETWILER

IN OLD Norse legends the ash tree is called the Tree of the Universe. This name is an appropriate one, for ash wood is exceptionally strong and elastic for its weight, and for centuries it has been highly valued for the good qualities that make it so useful in the modern world. The spear with which Achilles fought had a shaft of ash; the Indians made use of this wood for bows, paddles and canoes. Today ash wood is used wherever superior strength and elasticity combined with lightness in weight are required. Such uses range from baseball bats and snowshoe rims to musical instruments and aeroplanes. Most of the ash wood, however, is consumed in car construction, axles, poles and other parts of vehicles, handles of all kinds, wooden ware, agricultural implements and furniture.

Ash trees may be said to be the most highly educated of our common trees, since in the process which has caused one species to differ from another, they have acquired characteristics which botanists recognize as being very high in the scale of plant development. There are thirty or forty species of ash in the world, growing mostly in the temperate regions of the northern hemisphere. In North America, sixteen kinds of

ash trees are known. The olive-tree, the fringe-tree, the lilacs, forsythias and privets are all in the same family as the ash, but the mountain ash is not related to the true ashes.

The white ash is the most beautiful and the most useful of the American species, although in commerce the wood is seldom separated from that of the black, red, blue or green ash, which are often found growing with it. White ash is native to a wide territory, from Newfoundland and Nova Scotia west to Minnesota and south to Florida and Texas. It is found on rich, rather moist soil, on low hills and near streams, but it is not usually found in swamps such as the black ash often frequents. It is nearly always found growing mixed with other trees that love rich, moist soil. The best white ash grows in the lower Ohio River basin.

In the forest the trunk of the white ash is generally straight and free from branches until it divides into a short, narrow, conical or rounded top. In the open it forms a spreading, evenly rounded head; the lower branches extend nearly to the ground and often are curved in the shape of an inverted ox bow. Full-grown trees are seventy to eighty feet high, with a



From "Pennsylvania Trees" by J. S. Illick

THE WHITE ASH

1. A branch with a cluster of pollen-bearing flowers and young leaves, one-half life size. 2. A cluster of seed-bearing flowers. 3. A full-grown compound leaf, one-half life size. 4. A cluster of fruit, one-half life size. 5. A winter twig, one-half life size. 6. Section of a winter twig, enlarged.



BARK OF THE WHITE ASH

The bark is grayish-brown, rather thick upon the older trunks, and is sharply divided by diamond-shaped fissures into rather flattened ridges which are covered by thin, close-fitting scales.

diameter of two to three feet, but occasional specimens one hundred and twenty feet high and five or six feet in diameter may be found.

The greyish-brown bark is divided by deep, diamond-shaped fissures into narrow, flattened ridges that run lengthwise of the trunk. The surface of the ridges is covered with thin, tightly attached scales. Unlike black ash, which has an elastic, corky bark that powders easily when rubbed with the hand, white ash bark is firm and does not crumble. However, the scales on the ridges gradually wear away so that old trunks often have smoother bark than younger trees.

The buds of white ash are rather large, broad, short and blunt, and of a rusty-brown to dark-brown color. At the end of the twig is a bud larger than the others, on which it is plainly seen that the buds are covered with scales that stand opposite one another, like the halves of a clam shell, instead of overlapping as do the scales on the buds of most of our trees. Usually there are two smaller buds at the base of the terminal bud. All of the other buds are in pairs, opposite each other on the twig; in winter, a crescent-shaped scar appears beneath each bud at the point where the leaf was attached. These leaf-scars are of large size, raised and very noticeable, and differ from the leaf-scars of other species of ash by being notched at the top.

The twigs are thickened and heavy, standing opposite each other and nearly at right angles to the branch. When the foliage is off the trees the stout twigs appear clumsy, and their opposite arrangement gives a very orderly appearance to the branching. In color, the twigs are grey-

ish or greenish-brown. They are sometimes covered with a bloom, which, when rubbed off, leaves the bark shiny, showing plainly the large, pale lenticels, or breathing pores of the bark.

Instead of one large leaf-blade, each leaf consists of five to nine leaflets. The entire leaf is about ten inches long; at the end of the leaf-stem is a single leaflet below which are usually six leaflets, arranged in pairs. The leaflets are three to five inches long, about one and one-half inches broad, and are borne on a stalk one-fourth to three-eighths of an inch in length. This stalk on the leaflet of the white is much longer than on the leaflets of the other species of ash. The leaflets are broadly willow-shaped, dark green above, light green and often hairy on the lower surface. By midsummer the down has worn from them and they are perfectly smooth. The silvery color of the lower surface of the leaflet is peculiar to the white ash and gives rise to its name.

The flowers appear in May, before the leaves; the pollen-producing flowers are in dense, reddish-purple clusters, which turn yellowish in color when the pollen is shedding. The seed-producing flowers are borne in open clusters on separate trees; they are small, vase-shaped and purplish.



Courtesy of the Manual Arts Press

THE LEAF OF THE WHITE ASH

The leaves are about ten inches long with five to nine leaflets which are three to five inches long and an inch and a half broad. When full grown they are usually smooth and dark green above and pale below. A few hairs are sometimes found along the veins on the lower surface.

The fruit ripens in the fall and hangs on the trees, in clusters, far into the winter. The seed is one-half to three-quarters of an inch in length, resembling an oat-grain in shape. One end of the seed tapers to a point and is attached to the tree by a short stem; at the opposite end is a narrow wing about twice the length of the seed. Unlike the seeds of other ashes the wing is narrowed at the point where it joins the seed, and does not extend down the sides of the seed. In the black ash the wing completely surrounds the seed.

The wood is hard, strong, close-grained and tough. The heartwood is brown and forms a sharp contrast with the wide band of much lighter colored sapwood. The rings in the wood that mark each year's growth are set off plainly by lines of wide pores.

White ash grows rapidly for a tree whose wood is of such high quality. It has numerous insect and fungus enemies, none of which are very serious, and it is an excellent tree for mixing with white pine and other species in forest plantations for the producing of commercial timber. For ornamental purposes, its stiff, open habit of branching often affords a desirable contrast to bring out the beauties of trees with more delicate branch systems, like birch or beech. The foliage appears late in the season and falls early, but its soft, rich light-green color and the dense graceful masses of leaves, combined with the pleasing outlines of its well-proportioned top, gives value to the white ash for planting on wide avenues and estates. The finely divided root-system makes it easy to transplant. It grows well in decidedly wet, compact soils, although it is best adapted to drier situations. It is a good tree to plant near railroads or in other places

exposed to smoke, since it is less affected by smoke than the majority of shade trees.

In fall coloring the white ash is distinct from other trees. At first the entire mass of foliage turns purple



THE AREA OF WHITE ASH

then chocolate and from this to a violet brown, and finally to a salmon or yellow with a shade of lilac. When the leaves have faded nearly yellow they begin to drop from the tree.

It is not difficult to grow ash trees from seed. The seed should be gathered in the autumn. They may be sown at once or kept for planting in the spring by placing them on the surface of a garden walk, covering them with a box. A trench should be cut around the box to keep the water away. The seeds will not grow if kept too dry.

Commercial Uses of White Ash

SEVERAL species of ash are cut and marketed in this country, often without any attempt to distinguish one from another. Sawmills list ash without naming the particular species, and the woods of different ashes are so much alike that factories frequently have no interest in separating them. Their general uses are similar, and an examination of the lumber seldom reveals much difference in appearances or other qualities. The production of this lumber appears to run fairly even from year to year. There was a small increase from 1899 to 1900. The reported output for the whole country was 252,000,000 feet in 1907; 291,000,000 in 1909; and 246,000,000 in 1910. Much of the apparent difference was due to a difference in the number of mills reporting for the several years. The foregoing figures represent all the ash

lumber produced in the United States, and not white ash alone. Probably more than half of the total is white ash, and five or six other species make up the rest.

All of the early settlers east of the Mississippi River, and some west of it, encountered ash. Few farms were cleared without cutting this tree. Though it entered to a small extent into practically every use which the farmer, carpenter, mechanic, and lumberman made of wood, early writers mentioned it less frequently than some other timbers because it was not peculiarly fitted for any special purpose, as some others were. Some of the first American ash in the market went to Portugal in lumber shipments from New England. Between 1712 and 1718 ash "rafters" to the number of 1,100 were bought in Portugal. Rafter blanks from which boat oars were made. This wood was

Character and qualities—Heavy, hard, strong, ultimately brittle; rings of annual growth contain several rows of large pores which occur in the springwood and in slowly-grown specimens occupy nearly the whole ring; medullary rays numerous and obscure; color brown, sapwood much lighter, often nearly white.

Growth—Height 45 to 100 feet, diameter 3 to 6 feet.

Supply—The commercial range of white ash lies in all states east of the Mississippi River and occurs west of that stream in Texas, Louisiana, Arkansas, Oklahoma, Missouri and Iowa.



A FINE WHITE ASH

This tree is in South Park, Rochester, N. Y. The white ash usually reaches a height of seventy to eighty feet and in the open the crown is decidedly round topped and extends almost to the ground. In the forest the trees are usually tall and massive, clear from branches for a considerable distance from the ground, and with a narrow, somewhat pyramidal crown.

a commodity in the English market at an early date, and prior to 1789 had gained such firm hold that it had largely supplanted the ash from the Baltic Provinces. It was made into oars, as had been done in Portugal, and as is now done in the United States. The English employed it also for capstans, levers, bars, blocks, handspikes and pins.

Long before the Revolution the farmers of Susquehanna County, Pennsylvania, fenced their land with rails split from the unusually fine ash trees there. It is probable that the custom of putting ash to such use was general at that time, though the fact is not often mentioned in pioneer accounts. Ash splits well, and is an ideal rail timber in all things except that it has poor lasting qualities. Rails decayed in a few years.

It is recorded in the travels of John Lamson, early in the seventeenth century, that ash bark was good food for beavers. That seems a matter of trifling moment at the present day, but it possessed some importance at a time when

the skins of beavers constituted a considerable article of commerce.

Ash was one of the woods of which flax brakes were made when home-manufactured linen was a valuable article. Saddle trees and stirrups were among indispensable commodities in the making of which the wood was useful. Long-drawn splits bottomed rude chairs. It is said that the term "cane ash" dates from that custom. The splits were narrow, thin ribbons of ash, stripped from billets, and they were woven into chair bottoms and backs. They resembled the ribbons of cane or rattan commonly employed in chair work. The term "cane ash" is yet heard in some parts of the south, but is generally applied to extra fine timber without reference to the use that may be made of it.

Three long bows procured very early on the coast of Virginia by explorers, and now in the Ashmolean Museum, Oxford, England, are said to be ash. They show the use which the Indians made of this wood when they had the whole forest to choose from. The three bows at Oxford are highly polished and are nearly as black as ebony. The Indians probably strained or painted the wood.

White men made bows of ash in Virginia and elsewhere in the East, but not the kind used in archery. Such bows formed part of the equipment of heavy freight wagons. They arched six or seven feet above the bottoms of the wagon bed and the waterproof cover or



A WHITE ASH STAND

This is a typical and almost pure growth of white ash at Mount Gilead, Ohio. On the left side the trees are too near together for proper growth and the poorer ones should be cut out.



Courtesy The Hardwood Record

LARGEST ASH LOG IN THE WORLD

It is forty-five feet long, measures fifty-one inches in diameter at the big end and thirty-five at the smaller. It is owned by the Southern Hardwood Company and was exhibited in the Industrial Parade at Nashville.

tent was stretched over them. Before railroads were built and such wagons carried freight long distances, the merchandise was kept dry by the goodness of the canvas cover and the reliability of the bows. One such wagon route led from Baltimore, Maryland, to Knoxville, Tennessee, and another from Philadelphia to Pittsburgh. The wagons on their long journeys usually went in caravans of from five to thirty.

In 1750 Peter Kalm, the Swedish traveler, saw the Swedes and Finlanders of New Jersey making bowls and dishes of what he called "ash knobs," and he wrote of it as though it was a common practice among them. The custom was not confined to New Jersey. The wood selected was a burl varying in size from a quart measure to two gallons or more. The interlaced and contorted fibers prevented the wood from checking or splitting. The bowls were generally made by hand, a rather slow and laborious process, but Joseph Dodderidge wrote of their manufacture about 1780 near the Ohio River as though they were sometimes made on a lathe. An ash bowl of the primitive kind is in the Hancock House collection at Lexington, Massachusetts. If it is a fair sample they were very crude utensils.

Ash is preeminently a factory wood. The annual sawmill output is approximately 250,000,000 feet, and nearly all of it goes to mills and shops to be further manufactured. The largest factory de-

mand is in the states of Wisconsin, Michigan, Illinois, Missouri and Arkansas. From 45 to 50 per cent of the entire cut of lumber in the country is converted into manufactured commodities in these five states. The articles are so numerous and of so many kinds that they can be treated only as classes. Almost every industry that uses wood in considerable quantity finds place for more or less ash. It is reliable in whatever position it is placed. Manufacturers in Michigan list it as material in 92 articles and it is listed for 96 in Illinois.



Courtesy Dudley Lumber Company.

ASH LOGS READY FOR THE MILL

The annual output of the sawmills is about 250,000,000 feet and nearly all of it goes to mills and shops to be further manufactured. Almost every industry that uses wood in quantity finds place for more or less white ash.

A large portion of the ash supply of the country goes to the farm in one form or another. The amount made into agricultural machinery, tools, and implements is large, as is apparent from a list of the more common articles of this class; cornhuskers, cornshellers, hay presses, shredders, manure spreaders, grain binders, plows, hay stockers, soil rollers, potato diggers, threshing machines, and feed cutters. Some of these are made partly and others almost wholly of ash.

It is a great handle wood. Some of the handles belong to farm tools, others do not; but in all cases the wood is employed for handles because it is stiff and very strong. The preference which European farmers and gardeners show for American tools is said to be due in part to the excellent ash so generally used. Shovels and rakes are cited as particular cases. Other tools which are generally equipped with ash handles are pitchforks, hoes, spades and scoops. The same wood is often employed as handles for ice hooks, cant hooks, brooms, mops and whips.

Notwithstanding the almost universal presence of mowing machines on American farms, scythes are as numerous as ever, and the handle or snath is generally made of ash, as it has always been. The blanks of which snaths are made

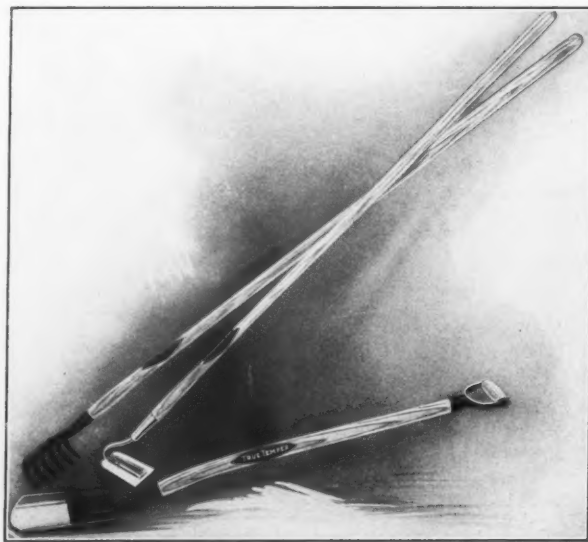
are first split to insure against crossgrain, then steamed, and bent to the desired form. A century ago it was customary to use them without bending, and such are still in use in some localities, particularly in the mountains of North Carolina and among the descendants of French settlers in Louisiana. It is claimed that the largest ash tree on record was manufactured into scythe snaths.

Baskets used by farmers and gardeners for grain, fruit and truck are often made of ash, particularly the hoops or bands which strengthen the thin splits constituting the woven frame of the basket. Singletrees, whiffletrees, eveners, and neckyokes are products made from even-grained ash.

The demand for ash in the boat industry has increased in recent years, though for a long time the use of the wood had been large. In Louisiana and Arkansas millions of feet of the best ash found in the primeval forests are yearly manufactured into boat oars. This commodity goes to all parts of the civilized world. For light oars and paddles, spruce is satisfactory, but for the heavier, stronger article,



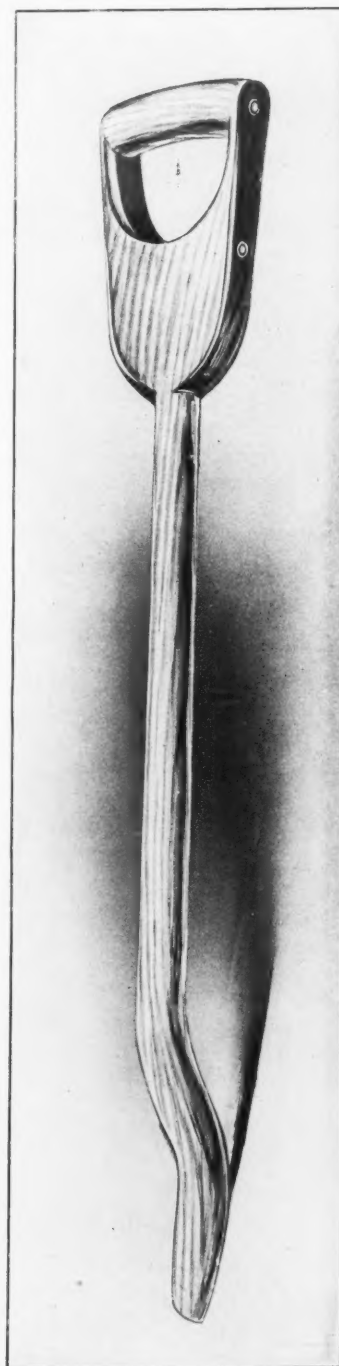
Courtesy A. G. Spalding & Brothers.
BASEBALL BAT MADE OF WHITE ASH



Courtesy American Fork & Hoe Company.

WHITE ASH HANDLES

Owing to its strength and toughness, white ash is particularly valuable for the manufacture of farm and garden tools.



Courtesy American Fork & Hoe Company.

SPADE HANDLE MADE OF WHITE ASH



Courtesy J. G. Brill Company.

WHITE ASH IN STREET CAR CONSTRUCTION

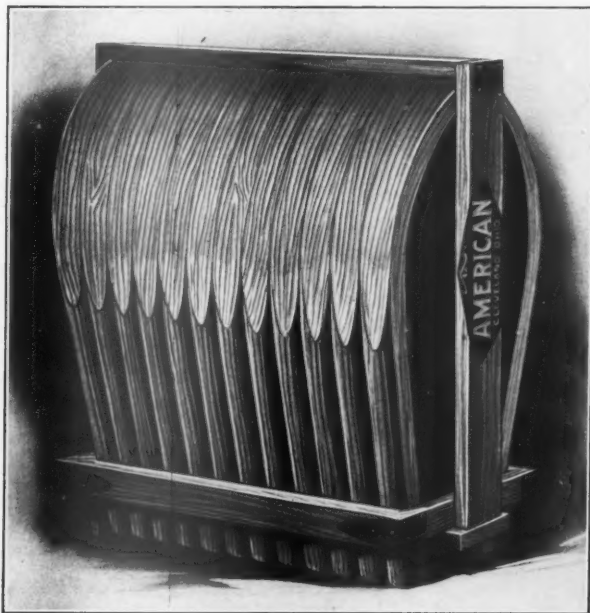
White ash is used extensively in electric cars and auto busses, forming the principal body parts; i.e., the side and corner posts, and the slats for the seats. It is also used for the finish of the cars.

ash is supreme among our woods. Its stiffness leads to its employment in the lower frames of vessels, large and small, but particularly among the small. This wood forms the frames of portable boats, which sportsmen and explorers carry into regions not accessible to boats of the ordinary kind. Canvas skiffs with ash frames have played an important part in the exploration and development of Alaska and other remote northern regions. The old voyageurs dragged their boats, weighing hundreds of pounds, up rapids and over portages; the present day travelers roll up and transport on their backs boats

of equal carrying capacity and of one-tenth the weight.

Other articles of ash, which are useful in boat construction or on board, are handspikes, levers for capstans, tackle blocks, and pins for the attachment of cordage. For these purposes its chief competitor in early years south of New England was red oak, and hickory was and still is a competitor. Ash blocks for hoisting sail, and for loading and unloading, are yet much used on board vessels. This same wood is employed as finish in cabins and staterooms.

The use of ash for bows on which to stretch the covers of freight wagons has been continued from early times till the present. Vehicles of the prairie schooner type are now scarce, but wagons of many other kinds demand ash for bows. Numerous business vehicles are in this class. Missouri wagon manufacturers use 1,450,000 feet of ash yearly; those of Arkansas 2,600,000; Illinois, 2,200,000. In Michigan ash leads all other woods in the automobile industry, the annual demand being about 7,000,000 feet. It appears probable that the automobile industry in this country demands more ash than goes



Courtesy American Fork & Hoe Company.

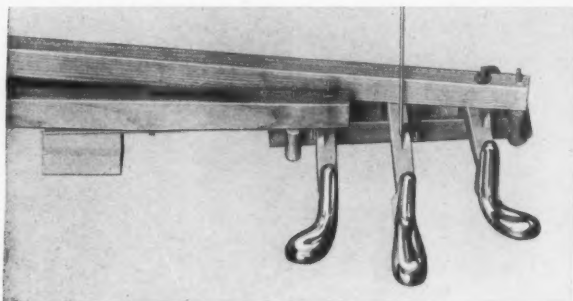
FINISHED OX BOWS OF WHITE ASH



Courtesy American Fork & Hoe Company.

OX YOKES OF WHITE ASH

to the wagon makers. It is frame material and only best grades are acceptable. In horse-drawn vehicles a considerable quantity of ash is made into tongues of heavy wagons, poles of carriages, and shafts of buggies. It is employed as axles for heavy wagons. In lumber regions



Courtesy A. B. Chase Company.

WHITE ASH FOR "TRAP STICKS"

The wood is usually used in the construction of musical instruments and this pedal trap work for pianos is made from the very best quality of solid white ash.

it is in common use for log wagon rollers. In light vehicles, in addition to uses previously named, it is employed as frames for bodies, and thin boards are best for curved panels. Ash is made into vehicles of yet smaller size, and appears as parts of baby buggies, push carts, and hand sleds. Frames of sleighs and cutters are often made of this wood. Its strength and toughness lead to its employment as beds for coal wagons and stone carts.

Railroad cars owe much to ash. Some is employed as frames and other as finish. It frequently serves the latter purpose in suburban car construction. The entire finish inside is often of ash. More than 3,500,000 feet a year are used by car builders in Illinois, and nearly as much in Missouri.

Ash is preeminently a wood for miscellaneous uses.



Courtesy the McClure Lumber Company.

A CURIOUS WHITE ASH TWIN BURL

The interlaced and contorted fibers of this peculiar formation prevents the wood from checking or splitting and the burl is in demand for making bowls and dishes.

It is peculiarly suited for a few purposes, and is fit for almost anything that demands a hard, strong wood. A list of industries in which it is employed will show this. It was reported by the following industries in Illinois in 1911: Boats, butter tubs, boxes and crates, buggies and light vehicles, cars, chairs, slack cooperage, electrical apparatus, freight and passenger elevators, farm machinery, furniture, handles, incubators, machine parts, mantels and cabinet work, novelties and toys, musical



Courtesy A. B. Chase Company.

GRAND PIANO RIM

This is made in three layers, the narrow or thin layers being of white ash and the light and dark layers being a combination of white ash, maple and poplar.

instruments, picture frames, refrigerators, sash, doors and blinds, window and door screens, school and lodge supplies, sporting and athletic goods, store and office fixtures, tanks, plumbers' woodwork, trunks and sample cases, vehicles, well and road machinery.

When it is remembered that each of these industries uses ash for a number of purposes, the general importance of the wood becomes apparent. For instance, it fills a hundred places in furniture, and appears as both outside and inside material, filling one place where strength is needed, another where hardness is the chief essential, and again where good appearance is sought.

Almost every musical instrument that uses wood of any kind has a place for ash. The largest pipe organ has it, and it goes into the mandolin, and nearly all instruments between these extremes owes something to this wood.

It is largely employed by the makers of athletic goods. A common article is the baseball bat. The best type, called "slugger," is usually of ash. The burnisher, a tool which smooths the bat, hardens the surface by friction, so that the impact when the ball strikes does not dent the wood. Tennis rackets and croquet sets are frequently made partly of ash.



Courtesy A. G. Spalding & Brothers.

WHITE ASH IS MUCH USED IN TENNIS RACKETS



Courtesy Dudley Lumber Company.

ASH IN A LUMBER YARD

Ash is usually cut as thick as possible, to the advantage of the log, and to produce the best quality of thick stock. The low grade is undesirable in thick lumber and is usually cut into $4\frac{1}{4} \times 5\frac{1}{4}$ thickness.

Bent rims, the kind used in the manufacture of circular measures, sieves, and cheese boxes, are made of no better wood than ash. It bends without splinters parting from the surface.

A very small but highly important use for ash is in the construction of aeroplanes. Wood of great strength, stiffness and of moderate weight is demanded. Ash is



Courtesy of the Southern Lumberman

WHITE ASH BOARD

not equal to spruce in this respect, but is next to it. A property of ash which greatly increases its value for airships is its straight grain. It is possible to cut long pieces with little or no crossgrain, though to do so the logs must be carefully selected. Ash appears in the propellers oftener than in the frames. Some builders construct the propellers of narrow strips glued together, thereby lessening the liability of unseen defects in the wood. A built-up propeller may contain a strip of ash in the middle of each blade.

The strength of ash leads to its use as sucker rods for pumping oil wells. These are slender pieces of wood, joined end to end, and aggregating great length. They reach from top to bottom of deep wells. A weak wood could not stand the strain but would pull apart.

The use of ash as flooring and interior house finish is of great importance. The difference in hardness between the

spring wood and summer wood of the annual rings causes unequal wear, and this lessens ash's value for flooring, but this has no effect on it when employed as interior finish. Stair builders find it valuable, particularly for newel posts, capitals, and other turned work of large size. It is sometimes shown with the natural grain, and sometimes artificial grain is imparted with a camel's-hair brush to imitate quartered oak. Parquetry flooring is one of its uses, and wainscoting another.

It holds a place of considerable importance in cooperage. Its open pores exclude it from most places in tight cooperage, but it is serviceable as pork barrel staves. Slack coopers are able to use it for many containers. It is excellent fuel, and has always been in demand for that purpose, but in late years its increased value has caused it to be diverted to other uses, except inferior trees and the waste from sawmills and factories.

(Much of the information in this article was secured by the courtesy of the United States Forest Service.)

WHAT BIRD DESTRUCTION COSTS

COLONEL G. C. SHIELDS, president of the League of American Sportsmen, says the destruction of birds costs this country the stupendous sum of \$1,000,000,000 a year, and supports the statement by statistics which deserve to be studied by every citizen who desires to be informed upon a question in which this whole nation has a profound interest. Because quail, prairie chickens, meadow larks and other birds which feed on bugs and insects of many kinds have been swept away by thousands, the cotton growers of the South lose \$100,000,000 a year by the depredations of the boll weevil.

Rock Avalanches

BY GUY ELLIOTT MITCHELL

"Beware the pine tree's withered branch,
Beware the awful avalanche."

BUT the avalanche bringing down hundreds of tons of packed snow, which is feared by the foresters and mountaineers of the West, is a mere mimic phenomenon compared with the tremendous rock avalanches which occur occasionally in various portions of the North American continent. The snow avalanche may sweep a trail some scores of feet wide for a distance of a mile or more down the mountain side, shattering to kindling wood, it is true, every tree in its path; rock avalanches, however, have scalped entire mountain faces, many feet deep and thousands of acres in area, removing millions of tons of rock and soil, covering entire valleys with the débris, damming streams and forming sizeable lakes. Rockslides of enormous magnitude have poured down the mountain sides in Alaska and British Columbia, but in the very heart of the United States—in the magnificent San Juan Mountains of Colorado—are probably the most extensive American rock slide areas.

Rock or land slides are of several sorts. They may

result from a breaking away of a rock mass—perhaps an entire portion of a mountain of unstable equilibrium as in the case of the great Frank rock slide later referred to—when the falling mass sometimes smashes to fragments and flows down the slope with incredible swiftness, or the slope of the mountain may have an underlying stratum of sand, or slippery clay, or other material which in an exceptionally wet period will not stand the weight of the overlying mass, or the slide may be surficial—the removal of a few feet of mud. In any case the destruction in the affected area is usually complete, while in a rock slide of first magnitude objects may be buried by a flow of broken rock to a depth of 100 or more feet. And when one of these unstable areas gets ready to slide, not all the engineering resources in the world could stop it, nor does it take more than a few seconds to do its work, leaving a sweep of waste of a hundred times greater magnitude than the most terrible avalanche of snow and ice.

The last destructive landslide in the San Juan Mountains was fortunately in an uninhabited area. It occurred



ROCK STREAM IMOGEN BASIN

The crumbling of the mountain peak, which resulted in this great rock flow, greatly reduced its bulk and lowered its altitude by probably several hundred feet. This tongue of "flow" is three-quarters of a mile long. It is a talus or "slide glacier" and is between the old and new workings of the famous Camp Bird mine.



ROCK STREAM AT SILVER BASIN

Viewing this enormous rock pile from a distance, one is impressed with its likeness to a great tongue of some viscous substance. The singular, billowy surface also suggests a slow, lava-like flow. All observed rock flows, however, have been of lightning-like rapidity. It is at the head of Silver Basin, San Juan Mountains, in Colorado.

less than a generation ago in the Cimmaron Creek Valley, covering several square miles, and every living creature in the stricken area was doubtless killed outright. The scene of the slide was visited within a few days by Whiteman Cross, then as now a geologist of the United States Geological Survey, accompanied by a photographer. The area had been well timbered, but the trees were all overturned, broken down, or standing at various angles, presenting a weird and grotesque picture. Slopes were exposed bare and many fissures gaped widely. Yet this slide, Doctor Cross says, was largely surficial—a soil slip rather than a rock or land slide—and not to be compared to a real rockslide. In another locality in the San Juan Mountains the C. H. C. Hill, near the town of Rico, progressive slipping is actually in effect at the present time and there seems to be no guarantee that the Cimmaron slide may not at any time repeat itself at this point. At one place near the town the stump of a tree has been split apart since the tree was felled and the two portions were recently observed by Doctor Cross to have separated about 5 feet in a period of four years. This earth crack was traced for several hundred feet. Any unusually wet period, such as Doctor Cross believes

to have caused the Cimmaron slide, may precipitate a catastrophe at this point.

It is the injection of the human element which largely determines the importance of natural catastrophes. The San Francisco earthquake a hundred years ago would have been of comparatively slight importance because but few people would have been affected. On the other hand, were the New Madrid earthquake of a century ago to now repeat itself, instead of terrorizing a few scattered pioneers in the Mississippi Valley it would probably kill a host of people, destroy big cities and cause incalculable damage. The eruption of Vesuvius or Etna is always a terrible calamity because of the thousands of inhabitants clustering on the slopes of the mountains; yet two years ago Mount Katmai, in an almost uninhabited section of Alaska, erupted with far greater violence than the worst Vesuvian outbreak and since no one was killed it has been looked upon principally as a most interesting natural phenomenon. On the other hand a prospective landslide of 40 or 50 feet of earth a few years ago at Mount Vernon would have been a national calamity. Fortunately this approaching slide was taken in hand in time, the dangerous under-

drainage was diverted and the home and tomb of Washington saved from slipping from its bluff into the Potomac River. But the lady regents who manage Mount Vernon may well at their annual May meeting appoint each year a committee to examine the small drainage tunnel which was cut to divert the water from the Washington grounds, and observe carefully that it is doing its duty. Were these the days of soothsayers, one of them might safely prophesy:

greatest of the earlier catastrophes, known as the Silver Mountain slide, has, along with many others, been mapped and described by the Geological Survey. It covers 12 square miles and the amount of rock which crashed down the steep mountain sides can be estimated only in hundreds of billions of tons.

With the true rock avalanches, it is the younger mountain systems, geologically speaking, which are most subject to convulsions. Those of the Himalayas which—



ROCK STREAM AT HEAD OF AMERICAN BASIN

Great as was this rock flow, in comparatively recent times, there were thousands of others incomparably greater in the early history of the San Juan Mountains in Colorado. The surfaces have been converted into soil and overgrown by forests and the evidences of sliding obliterated to the untrained eye.

"When the stream which drains Mount Vernon runneth dry,

Then the ancient home of Washington shall die."

The landslide areas of Colorado show that in long gone prehistoric ages, comparatively recent geologically but many hundreds of centuries before the first man, there must have been terrific disturbances in these mountains. The evidence is plain that there have been thousands of slides, some of them of enormous magnitude. Possibly the great saber-toothed tiger which ranged the valleys below and the prehistoric animals upon which he preyed may have heard the terrifying roar of the descending rock masses, but man was not present. One of the

though of course millions of years old—are comparatively recent examples of mountain building, have constant slides which would constitute great catastrophes were their slopes and valleys populated. Sir William Conway describes an instance of rock tumbling where the spur of a large mountain mass pitched bodily into the valley below. The front of the mountain had been undermined by springs, and in a twinkling of an eye a large part of the mountain slid down and shot across the valley, damming its river with a lofty wall, and forming a large lake. Masses of rock were hurled a mile away, blocks of limestone weighing 50 tons being sent through the air like huge cannon shots. This slide carried with it at least 800,000,000 tons of rock and debris. Many



Photo by Whitman Cross, U. S. G. S.

SLUMGULLION MUD FLOW

At the head of Slumgullion Gulch, Colorado, 11,500 feet altitude, the underlying rocks, having become decomposed into mud, were unable to hold the weight of the overlying rocks and the whole mass flowed down the gulch. The flow was six miles long, and dammed a fork of the Gunnison River, creating a lake. The sparse tree growth shows that the flow occurred many years ago.

such Himalayan rockslides have been recorded in the last half century, while among the remote and uninhabited regions of the great ranges numbers more are of constant occurrence. The formations of the Colorado landslide area point to many slides in the past even more stupendous than these. Fortunately this wholesale catastrophe era is ended for the mountains of the United States although the recent Cimmaron slide shows that all danger is not past, while the rock avalanches of the Alps and Alberta indicate that man's mining operations may precipitate such disasters.

Apart from the study of landslides with reference to the safety of human life, there is economic value in their investigation as bearing upon man's search for the precious metals. The geologist and the mining engineer look for coal and for metalliferous deposits in certain rock strata, and in undisturbed rock formations these strata are fairly regular, at least their position can be generally determined. There may be rock faults but these the keen geologist can trace. However, it is evident that even a geological wizard or a John Hays Hammond must be perplexed when the surface of a mountain slides off and two or three strata come tumbling down

and spread themselves over the slopes and valleys to depths of from ten to one hundred feet.

Doctor Cross, of the Geological Survey, says that the failure to recognize the true significance of the landslide phenomena has led to very great loss of time, labor and money in prospecting of the Rico Mountains in Colorado. The reason that much of the areas prospected have not been recognized as landslide in character is because the great slides of the San Juan region occurred long ago, and many of the surface traces have been obliterated.

Landslides are believed to be due generally to moisture which undermines foundations. In the San Juan, the upper strata are porous volcanic and conglomerate rock and these rest upon a sandy shale. There is no drainage, and consequently at times this unstable foundation becomes insufficient. The earlier physical formations of the San Juan Mountains were much bolder than at present. High, narrow ridges and peaks prevailed but the sloughing of billions of tons of their materials has greatly reduced the relief of the country. Many of the rockslides of the San Juan region have taken the form of veritable flows or rock streams. When seen from a distance these resemble glaciers covered with débris. To realize the terrific effect of recent landslides when asso-

ciated with human activities and to picture what would have been the result had a thriving mining town been in the pathway of even the small Cimmaron landslip, one

side. The gashes made by the two united below the slate quarry and left the enormous mass of mountain isolated and unsupported. Then four minutes later those who were watching the phenomenon from a distance beheld the whole upper portion of the Plattenbergkopf—12,000,000 cubic yards of rock—suddenly shoot down the hillside. The great mass pitched forward with tremendous velocity until it reached the slate quarry. Then the upper part shot forward horizontally straight across the valley and up the opposite hill-slope. A great wind was flung before it, which blew trees about like matches and lifted houses through the air like feathers. The avalanche, shooting with incredible swiftness across the valley, struck the opposite hillslopes obliquely and was immediately deflected like water down the level but fertile valley floor, which it covered in a few seconds to the distance of nearly a mile and over its whole width—a million square yards—with a mass of rock debris from ten to sixty feet deep. Before the avalanche there lay a peaceful village and fertile



Photo by Whitman Cross, U. S. G. S.

LIZARD'S HEAD

Once upon a time this lofty pinnacle in Colorado, 14,000 feet high, bore no resemblance to a lizard's head. That was before the major portion of the peak broke away from its moorings and crashed down the mountainside, a rock avalanche constituting millions of tons of stone.

must turn to the account of the great Elm landslide in Switzerland in 1881 or the Frank slide in Alberta in 1903.

The town of Elm is the highest village in the Sernf Meadow. Overshadowing it rose the steep Plattenbergkopf, the outmost buttress of a greater mountain mass. About half way up this hill was a slate mine. A creek began to form above the mine, which became twelve feet wide, swallowing up all surface drainage. It was believed that the mountain would ultimately fill, but no one thought the danger imminent. Rocks began to fall at intervals. September 11 was a rainy Sunday. Rock masses kept falling and the mountain groaned and rumbled. People gathered to fatch the falls, interested but not alarmed. Yet the villagers might better have lingered to witness a hundred-ton dynamite explosion. Suddenly a mass of the mountain broke away from the east side of the Plattenbergkopf, crashed down over the slate quarry and spread away over the flat. No one was killed by this fall, though the rocks reached within a stone's throw of where the sightseers were gathered. The people of the upper village now took mild alarm. A few minutes after a second and larger rock mass tumbled down over the west



FACE OF LANDSLIDE MOUNTAIN

The slopes of many mountains in the landslide area of Colorado have been scalped bare of every vestige of vegetation. With tens of thousands of tons of rock descending like a flash, the most heavily wooded mountain sides are swept like grass before a prairie fire.

grain fields; within twenty seconds a solid gray carpet had been spread, beneath which rested the remains of 150 human beings, their houses and their fields. The rock torrent had swept away half the village, its sharp edge cutting one house in two. All within the fatal edge were destroyed; all without were saved.

More recent than the Elm rockslide and nearer home was the disaster which ground to atoms part of the town of Frank, Alberta. Frank, an important coal mining center, is overshadowed by Turtle Mountain, a precipitous series of cliffs arising some 3,000 feet above the valley. Without warning, on April 29, 1903, a huge rock mass half a mile square and several hundred feet thick broke away from the mountain and plunged into the valley beneath, breaking into innumerable fragments and hurling itself up onto the opposite slopes to a height of 400 feet. Within a minute a square mile of pleasant valley was covered with jagged rocks from 3 to 150 feet deep. Providentially the greater portion of the town lay outside the course of the rock deluge; nevertheless seventy people were killed. One man, hearing the fall of the mountain, ran to his door in time to see the slide flash by, only a few feet in front of him. Another, hearing the noise, looked in time to see the fall of the mountain and almost instantly the spread of the material over the valley like a viscous fluid. Yet some of the rocks constituting the flow are forty feet square. Over two miles was traversed by the flow, which constituted 40,000,000 cubic yards of rock. It is believed that coal mining in the valley hastened the slide, nevertheless Turtle Mountain undoubtedly possessed a weak base. As it was, only one peak of the mountain slipped. Had the steep shoulder which looks directly down upon Frank gone, too, the entire community would have been engulfed. The Canadian Geological Survey investigated the phenomenon and warned the people to move up the valley, away from the mountain; the second peak, too, might go at any time. Little attention, however, was paid to the warning, so heedless is humanity, until winter before last, when the fearful groaning and grinding in the mountain told the inhabitants of the town in unmistakable terms that they stood in the pathway of imminent destruction; then the entire community hastily emigrated up the valley beyond the possible grasp of their fearsome neighbor.

HUGE NATURAL ARROW

FEW more singular natural phenomena can be found anywhere in the country than the great arrow head which may be seen on the desert-like slopes of the Coast Range in California. Strange, too, that this arrow should point directly to water in a part of the country where water is recognized as the most vital of Nature's gifts.

In 1851 Captain Hunt, leading a band of Mormon immigrants, descended the western slopes of Cajon Pass, California, after a journey of 500 miles across the Great American Desert, and beheld before him a smiling and well-watered valley, such as had not greeted his tired eyes and those of his companions since the departure of the caravan from the slopes at the base of the Wasatch Mountains, in Utah. On the mountain side near the Cajon Pass the travelers beheld the perfect form of a gigantic arrow pointing directly to a terrace at the base of the mountain where the few Spanish inhabitants of the valley told them great springs of healing waters

gushed forth. This arrow head is about 1,500 feet in length and perhaps one-half as broad. It is due entirely to the barrenness of the soil and the light color of the growth within its area as contrasted with the surrounding dark green chapparal. To the Mormon immigrants, however, as to the Spaniards who had preceded them,



INDIAN ARROW HEAD

One of the most singular natural features of the Pacific Coast of California is a gigantic, barbed arrow head which, strangely enough, points directly to a group of springs with medicinal and healing properties.

and particularly to the aboriginal Indians, such a matter-of-fact explanation as this did not suffice. It was to them the symbol placed upon the mountainside by the unseen hand of the Supreme Being to guide them to the healing waters at the base of the slopes.

The hottest of the waters that rise from this group of springs has a temperature of 202 degrees, and the discharge from all the various associated springs, some hot and some lukewarm, amounts to several thousand gallons a minute. A resort has been built adjacent to some of the more important of the springs and their water is used in bathing pools and for medicinal purposes. Water from other of the springs escapes to the stream flowing from Waterman Canyon which is taken out at the edge of the valley and used, as are other waters from these same mountains, for irrigation of orange orchards in the lower lands. The hottest spring of the group is called El Penyal. Another, and a cool spring, Fuento Fria, is located about one-quarter of a mile north of the present hotel.

The Annual Meeting

THE thirty-fifth annual meeting of the American Forestry Association will be held at the Copley-Plaza Hotel, Boston, Mass., on Monday and Tuesday, January, 17, 18, 1916.

The chief feature of this meeting will be reports and discussions concerning the effort to secure an extension of the appropriation for the continued operation of the Weeks Law. This is so important to New England and the Southern Appalachians in particular, and to the whole country in general, that a larger attendance than at any other annual meeting of the Association is expected, and desired.

On the evening of Monday, January 17, there will be a joint forestry banquet of the American Forestry Association, Massachusetts Forestry Association, and all the other forestry organizations in New England, at which are expected as speakers a member of the Cabinet and several of the leading men of the country.

Tickets for this banquet are \$3.00 each. Reservations for it are desired at once.

Send in orders, with or without the money, to P. S. Ridsdale, Secretary American Forestry Association, Washington, D. C., or Harris A. Reynolds, Secretary Massachusetts Forestry Association, 4 Joy Street, Boston, Mass.

Those desiring special tables of six or eight for special parties will please give notification as soon as possible.

The program for the two days' meeting is as follows:—

Monday, January 17—

9.30 a. m.—Meeting of the Board of Directors.

2 p. m.—General Meeting.

Welcome by the President.

Report of the Secretary.

Report of the Treasurer.

Appointment of the Nominating Committee.

Addresses—The Weeks Law Situation.

New England Forestry Problems.

Municipal Forests.

Report of the Nominating Committee.

Election of Officers.

General Business.

7.30 p. m.—Joint Forestry Banquet.

Tuesday, January 18—

10 a. m.—Addresses.

The National Forestry Situation.

Forestry and Lumbering.

Suggestions for American Forestry Association Work.

City Forestry and Its Future.

2 p. m.—Addresses.

State Forestry organizations and Problems.

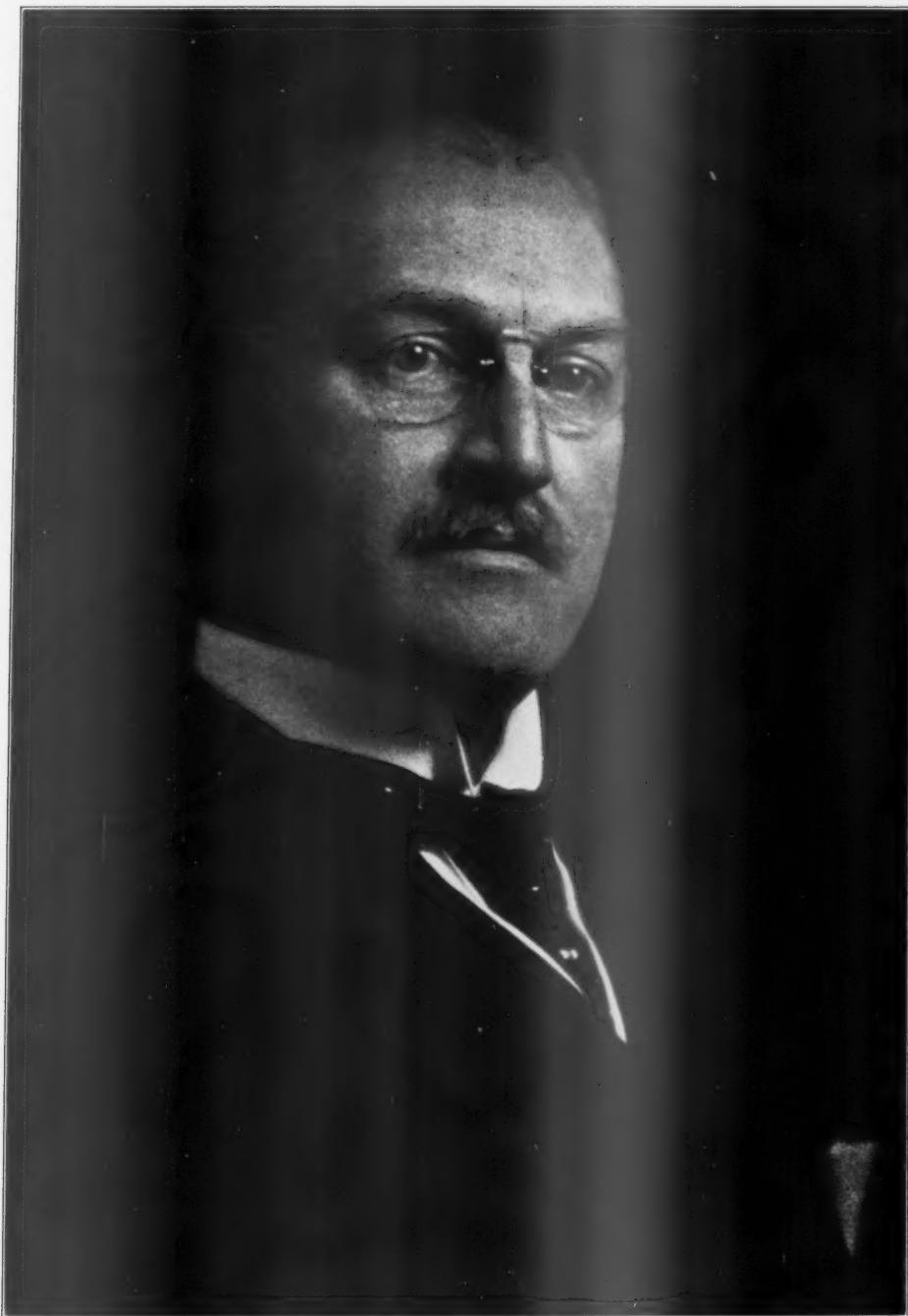
State Fire Protection Work.

The War on Destructive Tree Insects.

White Pine Blister Rust Menace.

4.30 p. m.—Meeting of the 1916 Board of Directors.

Adjournment.



MR. CHESTER W. LYMAN, OF NEW YORK CITY

Director of the American Forestry Association

CONSERVATION is an important factor in "preparedness." When the supreme test of war comes it is vital for a nation to have natural resources available as well as men and munitions.

Conservation ensures the perpetuation of the industries dependent upon natural resources, and when one nation is pitted against another in a life and death struggle industrial supremacy may determine the result. So the present war should give us a conception of conservation vastly more impressive than any considerations of sectional, temporary or mercenary advantage. We must have natural resources in abundance back of our fleets and forts for adequate defense of the nation's life, and conservation is the constructive principle essential to this end.

CHESTER W. LYMAN.

How Cigar-box Wood Is Secured

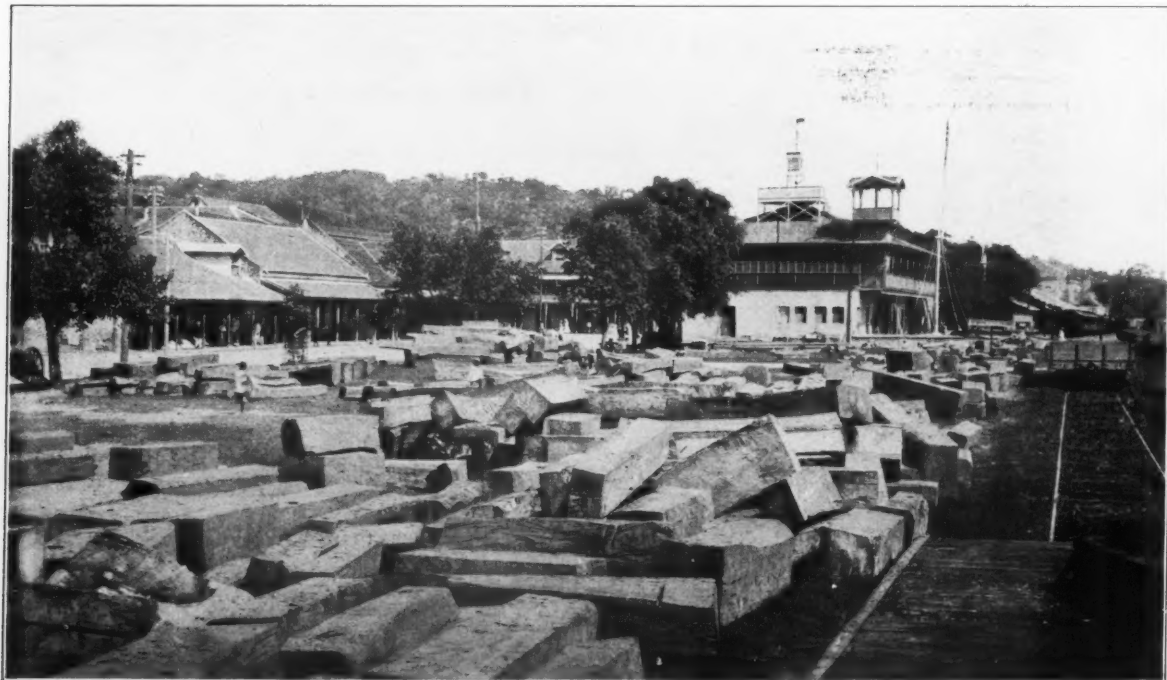
By C. H. PEARSON

THERE is perhaps no tropical wood better known than the so-called Spanish cedar of the West Indies and the Spanish Main. It is often referred to as cigar-box cedar, because the bulk of this wood is used for making cigar boxes. In the European trade it is known as cigar or sugar-box wood, since the term cedar as used in the American trade has at present no botanical significance and is, therefore, too confusing to be applied to a wood that belongs to the mahogany family of plants. The name cedar was originally given to this tree because of its resemblance in fragrance to the European cedar or sabine which is a cone-bearing tree known in Spanish as *cedro*.

Botanically speaking the term cedar should be applied only to certain species of the large group of cone-bearing trees, but it has long since been used as a generic or comprehensive trade name for the woods of a good many distinct kinds of forest trees. Some of these grow in America, some in Europe and others in Asia and Africa. The cedar of Lebanon, used so extensively in ancient times in the construction of temples and other large edifices, is famous in Scripture. The tall deodar of northern India produces the fragrant and most durable wood known in the trade as Indian cedar. The Atlas

cedar of northern Africa is another important wood to which the name cedar may be correctly applied. There are at least twelve distinct species of coniferous trees in the United States and equally as many in other parts of the world that are called cedar. In addition to these there are about thirty species of broad-leaved trees the woods of which are designated either locally or in the large markets as cedar or *cedro*. Chief among these are ten or more species of *Cedrela* to which the cigar-box wood belongs. These species are confined largely to the tropical parts of America and the most important one of them is the cigar-box wood, *Cedrela odorata*.

The generic term *Cedrela* was the original common name of the closely allied mahogany tree which grows in the same region as the cigar-box wood. The specific name *odorata* was given to this species because of the aromatic odor which can be easily detected in all parts of the tree. The leaves and small twigs contain numerous minute oil glands which, when crushed, give off a fragrance that can be detected for a considerable distance. The leaves and twigs are collected in parts of Cuba, Costa Rica and Nicaragua and used for distilling the commercial cedrelawood oil, which is sometimes used to give cigar boxes made from spurious cigar-box wood



CEDAR LOGS ON THE WHARF AT PORT OF SPAIN, TRINIDAD, READY FOR SHIPMENT

Practically all of the cedar shipped from this port goes to Hamburg where it brings from forty to sixty-five cents a cubic foot and has been sold for as high as eighty cents. With the steadily decreasing supply it is certain that the price will advance.



A CEDAR NEWLY CUT AND SQUARE TRIMMED FOR MARKET

The cigarbox tree is generally from eighty to one hundred feet high when cut and of from four to five feet in diameter above the root swelling. The trunk supports a massive crown which spreads gracefully over an immense area. It is usually broad and flat topped especially in the open.

the desired fragrance. The oil is exported to China, where it is known as ch'unshu or hiang ch'un.

Cigar-box grows in the warmest parts of America and is found in abundance in Cuba, Jamaica, St. Domingo and other West Indian Islands; it has never been reported from southern Florida, where its close ally, the mahogany, thrives on some of the keys and parts of the mainland. The bulk of cigar-box wood at present comes from Mexico, Central America and South America, where it is said to enjoy a wider geographical range than any other tree species. It is well known that this wood is exported from Colombia, Venezuela, Trinidad, and the Guianas, but it has not yet been satisfactorily determined whether the so-called cedar from the Amazon River valley and that which has been shipped from points along the Parana River in Argentina is the true cigar-box wood of commerce. It is probable, however, that the wood obtained in Brazil and in the country farther south is from several entirely different species, as the structure of the wood and the almost entire lack of odor indicate.

In its native state the tree grows in those regions where vegetation is abundant and the climate is warm all the year round. The soil and climate of tropical America are naturally adapted to the production of this important timber tree and there is no reason why the territory lying within its natural range of growth should not produce a large surplus of this wood which, next to mahogany, is

by far the most important kind that is now being shipped from tropical America to this or any other country. In nature the trees are seldom found in large clusters or groups, but singly and often much scattered. This does not argue that the tree would not grow well close together or in what the forester calls a pure stand. In fact, there are already a number of plantations which have proved successful and they are generally regarded as a source of considerable wealth. Many individual trees show a remarkable growth for their age. Trees only 16 years old have attained a height of 50 to 60 feet and a diameter of 1 to 2 feet. The rapid growth of cigar-box wood makes it suitable for reforesting the denuded areas in tropical America.

Mr. H. H. Markley in the May (1915) issue of *La Hacienda*, describes a plantation of 300 trees, 27 years old, which at the prevailing price of this wood is worth \$10,000. These trees were planted from nursery stock about 12 or 14 inches high in five rows at a distance of 18 feet apart each way. They received no care except that which resulted from cultivating the cocoa trees among which the young trees were planted for shade. There are a number of larger plantations in existence. One of these plantations in Mexico has about 20,000 trees, which at the present price of the wood will be worth one-half million dollars after the trees have attained merchantable dimensions. There is every reason to believe that the propagation of this tree under or-

dinary conditions can be made a very profitable undertaking on most of the denuded or otherwise unutilized areas in the West Indies and the mainland of tropical America. In common with all the other species of *Cedrela*, it may easily be propagated by seed or by cuttings and layers. It produces large quantities of seeds at a comparatively early age, and in locations where the soil is suitable the young trees spring up naturally in great abundance.

The cigar-box tree is usually of considerable size, generally from 80 to 100 feet high, but in some localities it attains a height of 125 feet. When it arrives at maturity it is one of the monarchs of the forest, often measuring 4 or 5 feet through above the root swelling. Occasionally trees are found in the forest that measure 9 feet in diameter 10 feet above the ground. As do practically all trees of the mahogany family, the trunks develop enormous buttresses which extend 8 or 10 feet above the surface of the ground. Above this root swelling the stem is usually round, straight and cylindrical, especially in locations where the trees have grown up in a forest or are surrounded by other lofty trees. The bark of the trunk is at first smooth and gray, but later in life it becomes rough and takes on an ashy-brown color. The trunk supports a massive crown which spreads gracefully over an immense area. It is usually broad and flat-topped, especially in the open; in the dense forest it develops a more or less cone-shaped crown. The small twigs give rise to beautiful foliage, bright, glossy and light, clinging so long to the spray as to make it almost evergreen. The flowers are pale yellow and arranged in large drooping panicles resembling those of the well-known Chinaberry tree. The fruit is a dry capsule, brownish in color, and about the size of a large plum.

Cigar-box wood generally comes on the market in the squared condition and free from sap; the latter is usually very narrow in old trees and of a reddish-white color. The heartwood is of a cinnamon-brown color. It is moderately light in weight, soft, strong, very durable in contact with the soil, works and splits easily, is susceptible to a high polish, shrinks and warps very little, has a very pleasant odor which it retains indefinitely, and possesses a bitter taste. The wood contains a gummy substance or semi-resinous juice, which tends to preserve it from attack of fungi, white ants and marine borers. The quality of the wood varies much according to the situation in which the trees grow. The wood obtained from trees grown on rocky upland soil and exposed to dry conditions is usually much harder, darker and susceptible of a higher polish than that from low, moist situations. In Trinidad the trees with hard and heavy wood are locally known as balata cedar, because the bark of the trunk is nearly similar to that of the balata tree. The Cuban growth is usually regarded as the best for the majority of uses to which cigar-box wood is put. The wood produced in wet or periodically flooded regions, as is the case in parts of southern Mexico and in the Amazon River valley, is very soft and frequently develops an excess of gum in its pores. Upon exposure to heat and light this gum diffuses in irregular spots de-

precating the value of the wood. Careful buyers of cigar-box material reject wood having this defect.

The importance of opening new territory which has not yet been culled of its cigar-box wood has long been felt. Several decades ago large quantities of this wood were to be found in easily accessible places in Cuba, Jamaica and Trinidad and along all the rivers in southern Mexico and Central America, but with the constant demand for high-grade cigar-box wood the bulk of the best trees have been cut and shipped. At present nearly all the available timber of this species is far removed from the larger streams which are the only means for trans-



STUMP OF A CEDAR 186 YEARS OLD

This tree was cut on Trinidad Island in 1912 where it is best known as Balator cedar because the bark is somewhat similar to that of the Balata tree. The quality of the wood varies much according to the situation in which the trees grow.

porting the logs to the shipping ports. As a result of this there has been an advance in price of cigar-box wood which many regard as considerable; but as a matter of fact, it represents no more than the increased cost of production including the increased cost of transportation. The permits to cut this wood cost more than they did formerly and the available trees are further back from the streams and often extensive improvements must be made to get the logs out at all. Labor costs more than it did ten or twenty years ago.

There is a pronounced feeling among many of the leading exploiters that still higher prices could be obtained for this valuable wood, upon the score of its intrinsic merit. It has a greater strength and is incomparably better than any other, with an equal degree of softness, for making cigar boxes. It will be seen that in this use a matter of 10 or 20 cents more a cubic foot, while apparently a large increase in price, would in fact be so

small a percentage of the price of the finished article as to be negligible. Long use of this wood for cigar boxes has demonstrated that as a matter of economy to the users it would stand an increase in price of 25 per cent and still be an economical material to be employed for that purpose. In Havana the wood sells for about \$100 to \$150 per thousand board feet. The range of prices (New York inspection) for the Cuban wood is from \$80 to \$110; for Mexican from \$60 to \$120, and for Central American grades from \$60 to \$90 per thousand board feet. These prices are quoted in the New York markets for logs scaled by the one-fifth rule. Although Cuban wood is considered the best, the growth from Trinidad has in recent years taken the lead in price. Practically all of the cigar-box wood produced in Trinidad goes to Hamburg, where it brings from 40 to 65 cents per cubic foot, and has been sold for as high as 80 cents.

It is not likely that the use of the wood will decrease. It seems that the increase in importation and use of the wood now depends greatly upon the development of sources of supply. At present the grand aggregate supply for the world's use appears to be at a standstill, but there are immense resources of this wood in the tropical countries and it can be a matter of but a few years before new districts will be opened up and perhaps the old ones further developed so that the supply will be temporarily increased. The extent of its use is likely to be limited only by the supply. The imports of cigar-box wood entered for consumption in the United States show a steady increase, their value in 1914 being nearly a million dollars.

The principal points from which cigar-box wood is exported are Tecolutla, Frontera, Cazonas, Laguna, Santa Ana, Chiltepec, Campeche, Coatzacoalcas, Minatitlan, Nautla, Tonzala, Cheucan, in Mexico, and also from a few points on the west coast. The chief ports in Central and South America are Belize, Panama, Colon, Porto Cabello, Carthagena, Puerto Colombia, Maricaibo, Georgetown, Para and Bolivia. A good deal of the material comes from points on the islands of Cuba, Hayti and St. Domingo, Jamaica and Trinidad.

The uses of cigar-box wood do not vary except that perhaps they are becoming more restricted. Its principal use in this country and in Europe is for making cigar boxes. It is made also into furniture of all kinds and is much admired for its rather close grain and beautiful satin-like luster resembling true mahogany. In fact cigar-box wood is considered by many a near equivalent to true mahogany for many purposes. In tropical America it has as many uses as the white pine has in this country. It is recommended for house construction and especially for interior trim, because white ants are said not to attack it. This is ascribed partly to the strong odor it exhales and also to the bitter taste of the wood itself. Another important use for this wood is for shingles, which are said to outlast those made from any other tropical wood. The logs coming into this country are too expensive to be converted into shingles and it is safe to say that fully 80 or 90 per cent of the logs entered

here go to the cigar-box factories to be manufactured into shooks and in this form are shipped to the various cigar-making centers like Tampa and Key West.

PRIZE FOR FIRE PROTECTION

IN ORDER to reduce the danger of fire after lumbering, the Vermont Forestry Department offers a prize to the lumber company that makes the best disposition of its slash during the winter of 1915-1916. The prize offered is the maintenance during the fire season of 1916 of a state or federal patrolman to protect the holdings of the company making the best effort to protect itself. This patrolman will be in addition to the regular force which has been maintained the past two years.

In offering this prize the Forestry Department does not impose any impossible conditions. It does not specify in what way the slash shall be disposed of. It does not require that the slash throughout a cutting shall be disposed of. It may be on a strip along the edge of the cutting. It is, however, stated that no applicants will be considered who have not made some disposal of slash over an area of at least 100 acres.

A NATIONAL FOREST ABOLISHED

THE President, upon recommendation of Secretary of the Interior Lane and Secretary of Agriculture Houston, has signed a proclamation abolishing the Kansas National Forest, to take effect on December 1, 1915. This National Forest is located in Finney, Kearny, Grant, Hamilton and Haskell Counties, comprising the sand-hill region of Western Kansas, and the public lands therein aggregate 138,729 acres of the total of 262,787 acres within its exterior limits. Of these 138,729 acres, 3,022 are withdrawn pending proposed legislation to reserve the same as a game refuge, there being a small herd of antelope in that region believed to be the last of their kind in Western Kansas.

BIRD'S-EYE MAPLE

MR. ROBERT T. MORRIS of New York writes to AMERICAN FORESTRY as follows:

"The excellent article on 'Commercial Uses of the Sugar Maple' in the November number of AMERICAN FORESTRY does not give due attention to one point of considerable consequence,—the value of bird's-eye maple for veneer purposes. Some years ago in Maine I ran across a man who devoted himself to searching the forests far and near for specimens of bird's-eye maple. He told me of finding one tree for which he had received \$200, if I remember correctly. I asked him why he did not set out one million sugar maple seedlings on land worth \$3.00 per acre, current local value, and then graft all of these seedlings from a valuable bird's-eye maple. This according to uncensored mathematics would give him about \$200,000,000 profit at the end of say sixty years,—a couple of years after his death perhaps. His reply was that he hadn't thought about it."

The Bird Department

By A. A. ALLEN, PH.D.

Assistant Professor of Ornithology, Cornell University

ATTRACTING THE WINTER BIRDS

ONE of the reasons for the present wide-spread interest in birds and bird-study has been the possibility, in recent years, of gaining an intimate knowledge of some of them in a comparatively easy manner. In the days when it was considered necessary to shoot a bird before anything could be learned about it, the number of ornithologists and the number of bird-lovers was relatively small.

The things that were learned, while of greatest importance to science and the cause of ornithology, were not the things that would serve to interest the laymen. The bird's skin and skeleton exhibited in the museum, like the stone and mortar from which the building was made, attracted only passing interest from the crowds. When the living bird was exhibited in a cage in the zoo, the crowds stopped for a moment longer, and now that the time has come when the stuffed specimen and the caged prisoner are giving way before the wild free bird, the whole populace stops to watch the small creature which, unafraid and unconcerned, goes about its life, not in the obscurity of the woods

or fields, but in the yard, in the tree next to the house, on the very window sill. When bird-lovers discovered how to attract and tame wild birds by the simple process of offering them the food which they liked and needed, they unwittingly so simplified the introduction to the study of birds that thousands of people have stepped across the threshold which formerly they hesitated to cross. They have now, through their knowledge of birds, acquired an interest in the out-of-doors, an interest which increases a hundredfold their enjoyment of walks afield, camping and outing trips, which breaks the hum-drum of every day, and even adds a spark of life to the walk to and from business.

For many of our birds, and particularly the winter birds, venture far into the heart of great cities, wherever they find trees and the possibility of eking out a living through the barren months. When they find a place where food is plentiful, they remain in the vicinity until the supply is exhausted, and if the supply never becomes

exhausted, and if other conditions are satisfactory, some species such as the woodpeckers, nuthatches, and chickadees will remain to nest and bring their young to the source of supply.

Let us see, then, what it is necessary for us to do in order to attract to our homes a merry troupe of winter visitors, bring them to our window sills, tame them so that they will feed from our hands, and keep them about us all through the lifeless months.

WHAT FOOD TO USE

The winter birds that may be expected to come to a feeding shelf are of two kinds, seed-eaters and insect-eaters. Among the seed-eaters in northern United States are the junco, the redpoll, the pine siskin, the crossbills, the grosbeaks, the song and tree sparrows and the blue

jay. In southern U. S. one could also expect the white-throated and white-crowned sparrows, the blackbirds, and the cardinal, and in the western states other species of finches and buntings. For seed-eating birds, good foods to use are millet, hemp, buckwheat and cracked grain of any sort, or better still, mixed chicken feed such as is sold for young chicks, sweepings from a neighboring mill, or hayseed from the barn floor.

The insect-eaters are the woodpeckers (the downy and hairy woodpeckers very widely distributed, the flicker, red-bellied and red-headed more common southward), the nuthatches, the chickadees, and the brown



A FRIENDLY CHICKADEE

Most birds learn to trust the people who feed them regularly and several species ordinarily discard their fear and even come to one's hand for food. The chickadee is one of the most confiding.

creeper. The woodpeckers find their natural food by drilling into the chambers of wood-boring larvae, the others find insects, pupae or eggs in the crevices of the bark. All of them, however, are very fond of beef suet, and once they have found a piece fastened in the tree, they will return to it again and again until it is all gone.



A JUNCO ON AN ANTI-SPARROW SHELF

The shelf is hinged to the window sill and supported at its outer edge by springs so that it bounces when a bird alights upon it. House sparrows are ordinarily too suspicious to feed on this sort of a shelf, while the native birds seem to enjoy the motion.

Sunflower seeds and crumbs of raw peanut are relished by both insect and seed-eating birds.

WHERE TO PLACE THE FOOD

One should not expect the birds to be tame at first, or to come immediately to the window sill. One of the greatest pleasures to be derived from feeding birds is to watch the gradual loss of timidity and the increase in confidence of the birds that come regularly to feed. At first they will be as wild as any birds of the woods, but gradually, as they find themselves safe and unmolested, they lose their fear when a new bird arrives among the regular visitors, he is always noticeably more timid than the others, and sometimes remains shy for several days.

In placing the food it is well to bear in mind that eventually one wants all the birds coming to the same place, either at a shelf at the window or to a place in the yard where it will be easy to watch them. It is well to first select the place where you wish them to come, whether you immediately build the shelf or not. Then, from this as a center, place the food along radiating lines to a considerable distance from the house. The more pieces of suet put up, the more quickly the birds will find it, and the sooner they will come to the window sill. It is necessary for only one bird to find one piece of suet in order to have eventually a considerable troupe coming regularly, for birds are ever on the alert watching their fellows as well as searching for food on their own account. When one bird finds the suet, the others will see him and soon follow.

At first it will be necessary only to tie the pieces of suet to the branches without protection of any kind, and the more conspicuous the places selected, the better. Later if there are many squirrels, or crows, or house sparrows about, it will be more economical to move the suet to the trunk of the tree, holding it in place by a piece of wire screening (one-half-inch mesh) through which the smaller birds can peck. This precaution will keep the squirrels and crows from imposing upon your hospitality and carrying the suet away in one piece. The house sparrows, moreover, are soon discouraged in trying to cling with their feet to the vertical trunk while feeding, but the native birds find this the most natural and the easiest way. Another method is to suspend from the outer branches, by strings, small wire baskets filled with suet. These baskets can easily be made from an ordinary piece of wire, as the size and shape are not important. Instead of using wire, some persons prefer to use a bag knitted from string and of such coarse mesh that the birds can easily peck through it. A half of a cocoa-nut makes a very satisfactory basket.

THE FEEDING SHELF

As soon as any of the birds have been seen eating the pieces of suet, it is time to put up the feeding shelf. This should be placed at a window on the sheltered side of the house (usually the south), preferably the one nearest to a



THE "ANTI-SPARROW" WINDOW FEEDING BOX

A chickadee is about to enter the box. The glass back admits plenty of light but keeps the food free from snow and ice if the box is placed so as to open to the south. One third of the floor is hinged and supported by springs or, less satisfactory, rubber bands.

tree. If the window sill is very broad, it will be sufficient to nail a cleat along the outer edge to keep the food from blowing off. Usually, however, it is more satisfactory to fasten a board, from eight to twelve inches wide, to the sill to act as a shelf. It may be made the entire

length of the window sill or only a part; but the larger it is, the more birds will feed together, for our native birds all want plenty of elbow room while feeding. A narrow strip should be fastened to the edge of the shelf to keep the food from blowing off. At the westerly end a small evergreen tree or large branch should be fastened. This offers shelter to the birds and proves as attractive as the food itself. It may be nailed to the window casing, or a hole may be bored in the shelf to hold it. It should be as large as can be conveniently held in place.

An even better device than the window shelf is the window feeding box here illustrated. An ordinary soap box is used and the bottom replaced by a pane of glass so as to admit plenty of light. One side is then rested on the window sill and the inner end nailed to the casing, while the closed glass side faces the north and the box opens to the south. This box has the advantage of protecting the food from the snow and ice so that it is always available when most needed. Evergreen branches or a small tree fastened nearby will help its attractiveness.

In many places house sparrows are so numerous that they will consume all of the food as fast as it is put out and leave none for the native birds, so that it is necessary to find some way to curb their enthusiasm. A very simple, yet effective way of protecting the food from their depredations is to hinge the front half of the floor of the box and support it at the corners by weak springs so that when a bird alights it bounces up and down. House sparrows are naturally so suspicious that when they feel the shelf give way beneath them, they lose no time in getting out of the way and never stop long enough to get any of the food. Our native birds, on the other hand, are unsuspicious and accustomed to feeding about the swaying branches of trees, so that the more the shelf bounces, the more they seem to like it.

In case there is not a satisfactory window at which to feed the birds, this box can be placed on a post in the yard four or five feet from the ground. An evergreen tree, a bit of shrubbery, or a pile of brush should be in the near vicinity to serve as a way station from the nearest trees, for most of the birds hesitate to fly long distances

through the open even to get food placed for them.

Another simple form of feeding shelf for such a place in the yard is made from the top of a keg or barrel, protected from the weather by a hood improvised from barrel hoops and a piece of white cloth and covered with a few evergreen twigs, as here illustrated. The front half of this may likewise be hinged to keep away the sparrows, and it may rest on a pivot and be provided with wings like a weather vane, so that it will always face away from the wind and snow. Various modifications of this device will undoubtedly occur to the reader.

If nothing but sparrows come to be fed, one should not get discouraged, because they will act as decoys and, eventually, their chirping will call other more desirable birds to the feast. One need not fear that they will drive the other birds away, for, next to the chickadee, the sparrow is the biggest coward of the lot, and frequently a single nuthatch will put a whole flock of them to route.

NOTES

Early in November the Boy Scouts of Mt. Vernon, N. Y., were told by Mr. Rockart, of the Shade Tree Commission, how the scouts could build bird houses under his supervision to be sold to the residents of Mount Vernon, thus keeping more birds with us through the winter. The birds are of untold worth to the city, not only for their beauty and songs, but particularly for their great assistance in fighting all kinds of insects

injurious to the trees of the city.

FELLING EGYPT'S TREES

THE trees of Syria are falling fast before Turkish axes, and their loss will be heavily felt when the war is over. Owing to lack of fuel, the fine pine forest on the outskirts of Beirut, a popular resort for the people of the city, is fast disappearing. But a severer economic loss will entail on the immense and rich olive plantations lying on the stretch of plain between the sea and Lebanon. It takes years before olive trees begin to bear, and the prosperity of thousands has depended on the crops of these orchards.



AFTER YOU, SIR

A simple form of feeding shelf for the yard with a chickadee waiting for a junco to finish. The shelf is made from the top of a small barrel; the hood from pieces of the hoops covered with white cloth and decorated with hemlock. The shelf is placed on a post four or five feet from the ground located preferably near shrubbery or evergreens.

Daniel Boone's "Bar" Tree

By WILBUR R. MATTOON, *Forest Examiner*

JONESBORO, Tennessee, a station on the Knoxville Division of the Southern Railroad, is located in the extreme northeastern portion of the State. It is the oldest town in Tennessee and during a time in the eighteenth century was the capital of the transmountain State of Franklin. A two-hour drive over hilly roads northeast from Jonesboro brings one to a tree which stands as a living record of an event in the life of probably the first white man to venture into the heavy forests formerly covering the western slopes of the middle Appalachians.

Of peculiar interest is the inscription borne by the tree to the effect that

"D. Boon cilled A BAR On Tree in thE yEAR 1760."

Because of the natural growth, however, and particularly the great number of initials of persons, States, towns, and dates "nicked" in the bark, no trace of the original inscription is now visible. Its presence on the tree is fully authenticated by historic record. Several old inhabitants living in the region stated to the writer that the inscription remained legible as late as 1875 to 1885, or from 30 to 40 years ago; and further indicated its location on the upper, or east, side of the tree, at a height of about six feet above the ground.

The tree is clearly a veteran of long standing. It is a beech, measuring 28½ inches in diameter at breast height (4½ feet above the ground), by about 85 feet in length, and about 44 feet to the first limb. The tree leans toward the south at an angle averaging perhaps 30 degrees. Its wide spreading, thrifty head centers above a point 45 feet distant from its base. The true vertical height of the tree, due to its striking and menacing lean, is between 70 and 75 feet. The tree stands on the smooth, west-facing, moderately steep slope of Carroll Creek which runs into Watauga River somewhat below Boone Creek. A tract of virgin timber, located not more than 100 yards away and composed of trees of oak, poplar, hickory, basswood, and walnut, of very large size and good development, indicates excellent soil and moisture conditions. It is to be regretted that a few years ago the forest tract surrounding the tree was cut over for all the timber except beech which now composes perhaps about one-quarter of the original stand. As a result, the tree is subjected at times to strong wind pressure.

The superficial roots at the base of the tree are freely exposed and, acted upon by frequent alternate wetting and drying, are subject to the harmful attack of wood-rotting fungi. One strong lateral root, on the upper or

anchorage side of the trunk, has recently cracked and broken due to heavy strain and rapid deterioration of the root wood. With a little labor further soil erosion and root exposure might be greatly checked and the day of the downfall of the tree probably be deferred for years. An effective method would be to drive low stakes of some lasting wood, red cedar for example, and strew the surface of the ground with brush wood, lopped short to allow ready access of visitors to the tree. The present



"D. Boon cilled A BAR On Tree in thE yEAR 1760."

This was the original inscription cut into this great beech tree, it is believed by the famous Daniel Boone. The tree is about 350 years old and is still in prime condition, although it needs protection from soil erosion about the roots.

grazing of cattle and other stock about the tree is very detrimental,¹ and could be prevented by the construction of an enclosure around the tree some 5 to 8 rods square.²

¹The removal of the natural ground cover of shrubs and herbaceous plants allows the sun to dry out and bake the soil. Erosion then takes place and the effect is marked by the reduced vigor of the tree.

²As this tree is on privately owned ground, the owner alone should not be expected to defray the cost of preserving this tree as a public monument. Public spirited citizens of the vicinity should be able to secure the permission of the owner to preserve the tree and should find little difficulty in raising the small sum necessary to safeguard this interesting historic possession.

To the forester the question of the origin and antiquity of the inscription is of much interest. Boone and other hunters are known to have been in Tennessee about the year 1760.³ Was the inscription about the "Bar" cut by Boone himself at the time indicated, or by his friends at some later date as a record of what they knew had previously happened?

In the spring of 1769, Colonel Richard Henderson of North Carolina, having under consideration the purchase



THE BOONE TABLET

Erected on the famous beech tree on the Boone trail from North Carolina into Kentucky.

of land from the Cherokee Indians, employed D. Boone and other hunters to make a reconnaissance and report on a large tract of land lying in what now comprises the eastern parts of Kentucky and Tennessee. A metal tablet erected by the Tennessee Daughters of the American Revolution near the tree marks the location of the "Daniel Boone Trail from North Carolina to Kentucky, 1769."

If inscribed in 1760, the inscription remained legible for from 115 to 120 years. That this may have been possible there is very good evidence, in spite of the well-known annual growth of the bark from the inside and the natural shedding on the outside. Mr. G. W. Simpson, living about four miles west of Jonesboro, and for many years County Surveyor of Washington County, states that he has repeatedly fully identified original exterior boundary trees along the old "North Carolina grant" survey in Tennessee, after a lapse of 125 years. The double inverted V (thus \wedge) was found plainly recognizable on trees which tallied completely with the survey notes in respect to species and peculiar form, such as a forking of the main stem. During a careful search over the bark of the Boone tree for old dates, one was found which read "1815." The outline of each figure, although very shallow and dim, was clearly traceable and unmistakably read by each of four persons in the party. This was on July 31, 1915, one hundred years after the

date of the inscription. Among many dates, 1862 and 1868 were very plainly readable, after a lapse of 47 and 53 years, respectively. In this connection, it should be recalled, however, that growth of both wood and bark is much more vigorous in the earlier half than during the latter half of the life of trees. Wounds consequently heal over more rapidly during the earlier period.

It is interesting thus to know that bark incisions are retained by the beech for periods of fully 100 years. Based upon growth measurements of the beech in other parts of its natural range, made by the Forest Service, U. S. Department of Agriculture, the present age of the Boone tree is estimated at between 340 and 360 years. Using the same authority, the tree had reached a diameter of about 16 inches in 1760, when the noted explorer, carrying a long Deckhard rifle, hunting knife, and tomahawk, blazed his way westward across the mountains into the attractive hill and valley country of what is now eastern Tennessee.

TEXAS' FORESTRY OPPORTUNITIES

MR. J. H. FOSTER, recently appointed State Forester of Texas with headquarters at College Station, has entered upon his work with the conviction that he has one of the best opportunities of any state forester in the country to render service to the people. Naturally the yellow pine and hardwood region of east Texas offers the primary field of work. Other regions of the state are, however, nearly if not quite as important. Trees should be made to grow on the great plains for shelter belts and for ornamental purposes. The wood lots of central Texas should be improved and made productive on lands which are of no value for other purposes. Forest areas in the rough limestone sections of the Edwards Plateau should be so managed that they may hold the waters in the tributary streams and so far as possible prevent floods and overflows on our river bottoms below. There is no section of Texas where an interest in trees is not important, or we may say, where the people are not in some way interested in tree culture.

According to reports, the yellow pine in Texas will have practically ceased to be an important commercial resource within thirty years or less, if the cut-over areas chiefly valuable for the growing of timber are not protected from fire and managed in some way which will insure continuous production. According to the Bureau of Corporation, there are standing in east Texas about sixty-six billion feet of timber, a third of which in round numbers is short-leaf and loblolly pine, a third long-leaf pine, and a third cypress and hardwood timber of various kinds. It may be said that these figures are considered by some of the best estimators to be far too high. At the present rate of cutting, even sixty-six billion feet will last less than thirty years. After that, to satisfy the demands of a rapidly increasing population, the supply of timber must come largely from outside the state and the consumer will have to pay the price of the lumber plus the freight, which together will amount to much

³"A History of Tennessee," page 27. By G. R. McGee, formerly Principal of Peabody Institute, Trenton, Tennessee.

more than the present price of the local product. This problem affects not only the eastern region, but the entire state. Texas can produce all the timber it will require for all time by re-foresting certain of the cut-over lands which are chiefly of value for timber production.

One of the large problems in this state will be to improve the streams in order to make them navigable and to reduce as far as possible the annual overflows. The Federal Government is expending millions of dollars

investigations. It is Mr. Foster's desire to work not only with the Federal Government, but to cooperate with all the agencies in the state which have similar interests. Texas already has a live forestry association. The lumber interests are favorable and friendly. The farmers, through their various organizations, will undoubtedly find much of interest along forestry lines.

There is a distinct advantage in having this new work closely related to the Agricultural & Mechanical College and with the State Experiment Station. According to the forestry law, the state forester is in charge of a new department of forestry and is forester to the Agricultural Experiment Station. Eventually there will be some strong courses of instruction added to the curriculum of the College so that students, particularly the agricultural students, may become familiar with the forest conditions of the state and learn to appreciate the importance of trees and to care for them in connection with their farms.



J. H. FOSTER

Recently appointed as the first state forester of Texas in accordance with the law passed by the last legislature. He has a most important work to do.

annually in river and harbor work in Texas. Many people do not realize perhaps that one way to aid in this work is to maintain a forest cover at the headwaters of the streams which will tend to prevent rapid run-off after severe rains and to prevent the washing of the soil. It would seem that ultimately the state may have a duty to perform in the direction of maintaining state forest on areas adjacent to the headwaters of important navigable streams.

Until the field of work of the state forester has been carefully mapped out, it is impossible to make any definite plans for the future. The chief problems which will engage his attention may, however, be mentioned as follows: 1. Fire protection; 2. a study of the grazing problem which is undoubtedly closely related to the fire problem; 3. protection of the headwaters of streams and the possible establishment of state-owned forests; 4. the development of better farm woodlots in the agricultural portion of the state; 5. the encouragement of tree planting in treeless regions of the state; 6. a study of the problem of forest taxation.

Without enlarging upon these various possible lines of work, it may be stated that the opportunities for rendering service to the state are large. There are many agencies which can be brought into line to assist in carrying out these measures. The Federal Government offers aid to the state in various directions, such as in fire protection, agricultural extension work, and in experimental

MICHIGAN FORESTRY WORK

THE Michigan Agricultural College was one of the first Institutions to start a Department of Forestry. In addition to the regular work of instruction, the College has been active in developing forestry in the State, chiefly in the agricultural districts. The head of the Forestry Department is Forester on the staff of the Agricultural Experiment Station and the College employs a Field Agent in Forestry who devotes his entire time to extension work. The College maintains a large forest nursery and small planting stock is sold at cost to people in the State. In the year 1913 to 1914 the number of small trees distributed was two hundred and twenty thousand, and it is estimated that about two hundred acres of private lands were planted through the activity of the Agricultural College in that year. During the past year, three hundred and twenty-two thousand trees were distributed, sufficient to plant about three hundred acres of land. The greater part of these trees go to farmers and are used for forest plantations, wind breaks, fixation of shifting sands along the lake shore, etc. The College has also been very active in developing forest management of existing woodlots. It is now establishing experimental willow holts in various places. Its organization for forestry work in the agricultural districts is very complete.

The Act for the exemption of small forests from taxation placed the rules and regulations and certain other matter pertaining to the act under the State Board of Agriculture which naturally handles forestry matters in the agricultural districts.

A. K. Chittenden, Professor of Forestry at the College, says:—"I believe that forestry work in the agricultural communities can be handled most satisfactorily and to the best advantage through the Agricultural Experiment Station and the Agricultural College, as they come in touch with such communities and are familiar with the problems met with. I regret that an impression is often given that Michigan is doing little or nothing in forestry in the agricultural districts, because on the contrary, it is doing far more than almost any other State."



Courtesy American Genetic Association.

THE LARGEST SHADE TREE IN THE UNITED STATES

This giant is a sycamore at Worthington, Indiana. It is forty-four feet six inches in circumference near the ground and 150 feet tall. This species, besides having the largest shade tree in the United States, is also one of the best species of shade tree, being peculiarly able to stand the smoke, dust and gases which, in cities, have to be overcome by any tree which prospers. It is also unusually resistant to attacks by insects.

The Biggest Shade Tree is Also Best

THAT the largest shade tree in the United States, as brought to light by the prize contest held by the American Genetic Association, should turn out to be the eastern sycamore is not surprising, say government foresters. The sycamore has long been re-

garded as the largest deciduous tree in North America and its range of growth is hardly second to that of any other broad-leaf tree; for it can be found from Maine to Florida and as far west as Kansas.

The bestowal of the prize on a sycamore at Worth-

ington, Indiana, which is 44 feet 6 inches in circumference and 150 feet tall, draws attention to the fact that foresters and arborists are nowadays recommending the species especially for city planting. They say that long experience with sycamores planted in city streets has shown that the species is peculiarly able to withstand the smoke, dust, and gases which are usually an unavoidable complement of urban life. In addition, the sycamore is as resistant to attacks of insects and fungi as almost any species, and is a quick grower; at ten years of age, a healthy sycamore usually is already large enough for shade, as well as for decorative purposes. As for the latter, there is hardly any eastern species which is generally held so picturesque as the sycamore. With its strikingly mottled bark and magnificent stature and conformation, the sycamore has a marked individuality and can not be mistaken for any other species, either in the summer when the foliage conceals its structural form, or in the winter when the leaves are absent.

A common objection to the sycamore as a lawn tree is its habit of dropping its leaves before autumn. From this characteristic it is sometimes called a "dirty tree." Recently a letter was received from a suburban resident who has a sycamore on his lawn. "My sycamore tree is very beautiful," said the writer, "until about the first of August, when its leaves begin to fall. Is there any remedy that I can apply to the tree to keep it from dropping its leaves so soon?" It was necessary to tell the correspondent that this was a characteristic habit of the tree. This drawback, however, is practically the only failing that the sycamore has, and it is offset by many desirable qualities.

On the other hand, there is little prospect of popularity, foresters say, for the valley oak of California, which was decided to be the largest nut-bearing tree in the United States, the contest unearthing a specimen in San Benito County, which is 37 feet 6 inches in circumference and 125 feet high. The valley oak is a very beautiful tree, but it attains maturity only after three or four hundred years; its wood is too tough, knotty, and otherwise imperfect to be good for lumber; the tree grows too slowly to be planted for shade or decorative purposes, and, being found only in California, it would have a small field of usefulness. Horticulturists say that the valley oak is not popularly considered a nut-bearing tree; for its acorns are not generally used for food, although, of course, they are edible. Foresters say that the chestnut and the black walnut are the largest nut-bearing trees in this country, and the contest did, in fact, unearth a chestnut, near Crestmont, North Carolina, which is 33 feet 4 inches in circumference and about 75 feet tall.

The contest brought forth photographs and authentic descriptions of 337 trees in all parts of the United States, making a distinctly valuable contribution to existing knowledge of native trees. It was found that, in all probability, there is no living elm larger than "The Great Elm" at Wethersfield, Connecticut, which is 28 feet in circumference, and about 100 feet tall, and is estimated

to be 250 years old. Many remarkable specimens of species which ordinarily attain only small sizes were unearthed by the contest, furnishing new records of maximum growth. A sassafras was brought to light at Horsham, Pennsylvania, which is 15 feet 10 inches in circumference at four feet from the ground, whereas, for example, not long before this a Georgia town claimed that it had the largest sassafras tree in the world, though this tree was only something over 7 feet in circumference. A white birch was found in Massachusetts with a girth of 12 feet 2 inches; a pecan was found in Louisiana with a circumference of 19 feet 6 inches, and a catalpa in Arkansas with a girth of 16 feet. The tallest tree found is a yellow poplar in North Carolina, which is 198 feet high and has a circumference of 34 feet 6 inches.

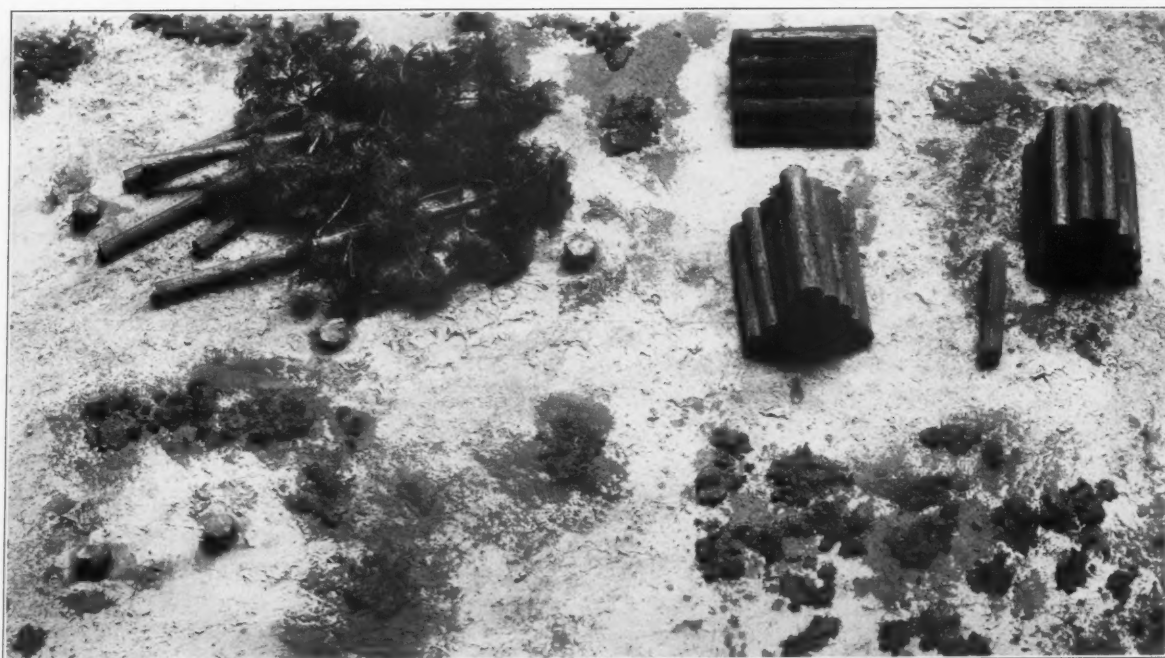
The value of the contest lies in its contribution of new information as to the maximum growth attained by deciduous species and the localities in which the different species seem to grow best. The relative sizes of the coniferous species are fairly well established, the Bigtree of California, for example, being the largest in the world; but information on the size attained by deciduous trees in this country has been very incomplete.

ARTICLES ON NATIONAL PARKS

AMERICAN FORESTRY takes pleasure in announcing that starting in the January issue it will publish a series of profusely illustrated articles on the scenic features of the National Parks by Mr. Mark Daniels, Superintendent of National Parks.

USE THE DEAD LEAVES

EVERY shade tree owner in New York State should learn the simple lesson of conservation which nature is teaching in our forests in the utilizing of the autumn leaves. Where a few shade or forest trees are throwing their foliage about the home grounds, they should by no means be raked up and burned because it is like burning so much valuable stable manure, but they should be composted where that is possible or used as a mulch around flowering perennials, roses and often large trees. By wetting the leaves thoroughly and then weighting them down by sticks or soil, they will be a splendid winter protection and the weight and moisture of the winter's snow will bring about rapid incorporation of the mulch with the soil. Where autumn leaves are to be used as a mulch about fruit or very young shade trees, some care must be exercised in not putting the mulch too close to the stems as there is danger of the mulch harboring mice which during the winter might girdle the young trees.



MODEL OF WASTE IN A LOGGING OPERATION

This photograph is one of a series of five models prepared by the Forest Service for exhibition purposes to indicate the "Loss of Wood from the Forest to the Consumer." The first model shows the trees growing in the forest, the contents of which in board measure was taken to be 100 per cent of 45,000 feet. The second model, shown above, represents the "Logging operation." Here the trees referred to in the description of the first model are shown as having been felled, with tops laid aside and logs piled. The waste here is in the tops and stumps, and has been computed to represent together 13 per cent, or 5,954 board feet of the original trees, 87 per cent or 39,846 board feet of the original trees being the contents in board measure of the logs secured in the operation.

The Forest Service Exhibit

BY DON CARLOS ELLIS

THE exhibit of the United States Forest Service at the San Francisco Exposition, which was viewed by many thousands, was most valuable in imparting a knowledge of forests and all they mean to the people. The purpose of the display was to show, first, the need of forest protection because of the value of the forest to the health, wealth and beauty of the country, and because of the great destruction of forests, due to waste in use and to fire; second, the results of Forest Service investigations in the reduction of waste by the use of better methods of manufacture and the making of by-products, the preservative treatment of timber and proper wood conditioning; third, the protection and administration of the National Forests; fourth, that these Forests are very much used by the public; and fifth, the nature of the most important of those uses.

As the visitor entered the exhibit space from one of the main entrances the display which caught his eye was a series of five models showing the progress of wood from the forest through the sawmill and the planing mill to the finished house and telling the waste of wood incident to each step. This waste amounts to about 65 per cent of the original tree. Alongside these models was a

series of four models of a paper machine, a wood distillation plant, a woodworking factory, and a tannic extract plant, bearing labels suggesting that much wood waste can be utilized in the manufacture of such by-products as paper, alcohol, acetate of lime, wood flour, acetone, turpentine, rosin, tannic acid, and oxalic acid, and many small wooden commodities. Above the case containing these models was a frieze upon which many of these commodities, the by-products which can be manufactured from waste and specimens of the waste, were displayed. The Forest Service has established a wood-waste exchange for bringing those having waste wood to dispose of in touch with those who can use it.

A miniature impact timber-testing machine was at work upon a raised platform, beneath which were displayed timbers whose resistance to various kinds of stress has been determined at the Forest Service laboratories. Pictures of the various types of timber-testing machines were placed at the ends of the table.

An exhibit of special interest to lumbermen was a working miniature of the humidity dry kiln used at the Forest Products Laboratory, Madison, Wisconsin, in which both temperature and humidity can be controlled.



MODEL OF WASTE IN A SAWMILL OPERATION

This is the third of the series of five Forest Service models showing "Loss of Wood from the Forest to the Consumer" and illustrates a "Sawmill Operation." The piles of rough lumber shown to the right of the sawmill represent 44.30 per cent, or 20,289 feet of the original trees. Just back of the lumber piles can be seen the trimmings and edgings which comprise 7.56 per cent, or 3,462.48 board feet of the original trees. To the left of the picture are shown a pile of slabs and one of sawdust. The former represents 18.88 per cent, or 8,647.04 board feet and the latter 11.47 per cent or 5,253.26 board feet of the original trees. In this operation there is lost in handling and standardizing 4.79 per cent, or 2,193.82 board feet of the original trees. The total waste in the sawmill therefore amounts to 42.97 per cent or 19,556.60 board feet of the original 45,000 in the standing trees. Two other models complete the set, one representing the planing mill operation and the other the building operation, each with its respective actual raw material consumption and resultant waste accumulation expressed in per cents and board foot quantities in reference to such contents of the original trees. The object lesson presented by the full set of models is intended, as mentioned above, to show the total loss of wood from all causes from the forest to the consumer. In building the average eight-room frame house it has been ascertained that approximately 35 per cent of the raw material is utilized and 65 per cent wasted, such waste for the most part being necessary.

The results of investigations which the Service has conducted in the preservative treatment of timbers were shown by photographs and charts. A supplement to this display had been placed in the exhibit of the Bureau of Mines in the Palace of Mines. It consisted of eight mine timbers which have had service in a Pennsylvania coal mine.

The great central model of an idealized Ranger District on a National Forest showed also reforestation work, permanent improvement work not directly related to fire protection, such as a Ranger Station and a drift fence, and the important public uses of the forests. These uses were shown by a forest homestead, a timber sale, a patented mining claim in operation, a water-power development, a free-use summer camp and a hotel operating under a special-use lease. Two mountain streams had their rise in the upper reaches of the model's landscape and formed a junction before they disappeared down the valley. Actual water was used in these streams and lent much to the realism of the exhibit.

The various features of the work of the Forest Service and the various uses to which the forests are put, which were exemplified in the large model, were amplified by other exhibits surrounding it.

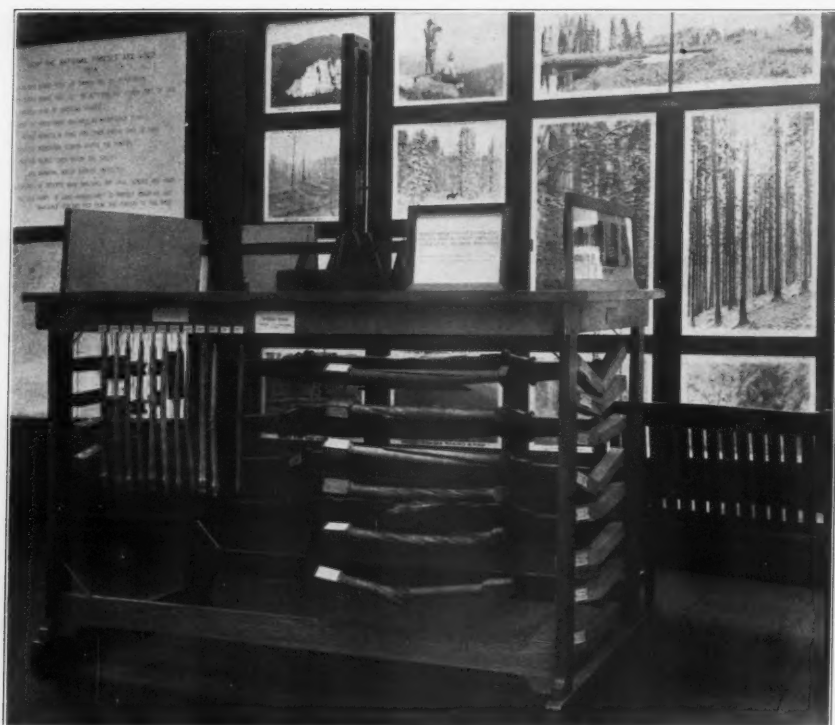
On one side of the central model three models, 4 feet square, of an acre of western yellow pine were shown on a scale of about 1 inch to 10 feet; so that trees 180 feet high in the forest were 18 inches high on the model. The model in the center showed the acre in its virgin condition ready for logging. On one side was shown the acre after it has been logged under Government regulation on a National Forest, with stumps cut low, logs cut from high into the tree tops, young growth protected, brush piled

for burning, and a future forest insured. To the other side the same acre was shown as it would appear under the wrong kind of logging. Stumps were high, large tops were left unused, many logs were shattered by careless felling, young trees were broken by old ones falling upon them, young trees were felled, dead trees left standing, and the brush lay where it falls, constituting a serious fire menace. In the pedestals under these models were panels of all the important species of wood sold on National Forests. On the wall behind was a chart showing that timber sales on the National Forests have grown from 68,475,000 board feet in 1905 to 626,306,000 feet in 1914.



COYOTE KILLING A LAMB

The Forest Service rangers conduct a vigorous warfare on the National Forests against predatory animals and kill thousands of them each year. This was one of the models at the Exposition.



RESISTANT POWERS OF WOOD SHOWN

A feature of the Forest Service exhibit at the Panama-Pacific Exposition which was of great service and interest to users of wood for various purposes.

Specimens and descriptions of important range plants growing on the National Forests and some of the most important poisonous grasses from which the Forest Service is trying to protect livestock, were displayed in show cases, above which were shown photographic enlargements of livestock grazing on the National Forests and of various improvements being introduced by the Service for the benefit of the livestock industry, such as the development of water holes, the building of drift fences and experiments in grazing sheep in coyote-proof pastures. Next was a mounted group of a coyote killing a lamb. The label for the group stated that livestock owners lose about \$15,000,000 from predatory animals a year, that over four thousand of these animals are killed every year on the National Forests and that the Government has this year appropriated \$125,000 for their destruction on the National Forests.

One of the most popular exhibits was a working erosion model six feet square, which showed some of the effects of deforestation on stream flow and surface formation. Two hills of the ordinary clay were built up on the rear of the model. One of the hills was covered with moss and foliage to represent a forest or brush cover and the humus soil beneath it; the other hill was bare of vegetation. A sprinkler arrangement sent down a shower of water in the form of rain on both slopes. The water flowing on the bare slope rushed off the surface immediately, carrying soil with it, and depositing it in the stream bed and the lake at the front of the model. The water flowing on the protected hill was absorbed by the natural reservoir which the forest affords and seeps out

regularly as clear water. Water fell on the forested hill daily since the opening of the Exposition and no soil had to be replaced. The stream on this side of the model and the lake below were filled with clear water. Farm land below the forested slope was in good condition; below the deforested hill the river had overrun its banks, flooded the farm land and left deposited upon it the infertile clay of the hills.

Placed between this model and the large central model of the idealized National Forest was a relief map of a complete watershed on the Chelan National Forest, Washington, which showed a typical watershed protected by forested slopes.

Three great windows in the rear of the exhibit were covered, up to ten feet in height, with sixty-three large colored transparencies showing forest types in different parts of the United States and abroad, forested and

deforested watersheds and the erosion due to deforestation in this country and in China, various important activities on the National Forests, picturesque scenery and recreation sites on the National Forests, types of National Forest land in different parts of the country, uses to which the National Forests are put, roads, trails, bridges, telephone lines and other permanent improvements on the National Forests, wind breaks of trees and their benefit to crops.

On the wall spaces between windows were a relief map and two charts. The relief map is on the curvature of the earth, gave the locations and names of all the National Forests, and showed that they are situated along the mountain ranges where they protect the headwaters of streams rising in these mountains, as well as assure the future timber supply. Above this map was a list of the important uses to which these National Forests were put by the public in 1914. These uses were as follows: 626,306,000 board feet of timber cut by purchasers, 120,575,000 board feet cut by settlers and others free of cost, 9,238,863 head of livestock grazed, 266,797 horsepower available at water-power plants, 16,760 permits in force for other special uses of land, 1,500,000 recreation seekers visited the forests, 1,200 municipal water supplies protected, \$838,980 of receipts made available for local schools and roads, 164,000,000 acres of land administered to protect irrigation and navigable streams fed from the forests of the West. The third chart showed that only one-fifth of the timbered area in the United States is held in Government ownership and properly protected.

That Alaska is not a barren and treeless waste was

convincingly shown by a four-foot Sitka spruce log from the Tongass National Forest, Alaska, measuring sixty-one inches in diameter, which stands in the Alaska exhibit. The log was cut from a tree 180 feet tall, measuring seven feet at the base.



MODEL OF FIRE LOOKOUT STATION

A Forest Service exhibit which attracted much attention and into which thousands of visitors to the Exposition climbed.

Because of limited space, not all activities of the Forest Service could be covered in the exhibit. Much of the work not touched upon in the display could be learned about at the government motion-picture room in the Palace of Liberal Arts, where 12,000 feet of film showing Forest Service activities were projected; from the publications displayed upon a table in the exhibit; and from the illustrated lectures on the National Forests and Forest Conservation given from once to thrice daily.

The exhibits of the Forest Service and of the other branches of the United States Department of Agriculture were not entered into competition for awards. This was in keeping with the precedent established at other international expositions in which, as in this, the United States was the host nation.

INVITE A FRIEND

AMERICAN FORESTRY magazine is now so well worth having that each member of the Association is asked to invite a friend to become a subscribing member.

STATE FORESTER AND MARYLAND TOWNS COOPERATING TO IMPROVE PUBLIC SHADE TREES

UNDER date of September 8 the State Forester of Maryland addressed a letter to the public officials of all incorporated towns in Maryland suggesting a cooperative and systematic means of improving existing conditions in public shade trees. Briefly, this plan provided for practical work to be devised and carried out under the State Roadside Tree Act of 1914, and the method of procedure set forth in the letter was the result of several months of successful experience in the carrying out of the duties delegated to the Board by the present Act.

Free of cost, the State Forester offered to take a tree census in any town where application was made by the proper officials, the census taking account of the trees, their kinds and locations, and to be followed by a report caterpillars of the brown-tail moth spin a web in the fall with recommendations for such planting and general improvement as the census showed to be required. The preliminary examination is succeeded by the performance of the work advised in the report, all work being carried out under the personal direction of a State Forest Warden whose services are made available for such duties at a reasonable per diem rate.

That the possibilities of this offer have been appreciated is attested by the fact that during the next three weeks several towns and cities in the State took advantage of this offer to secure expert aid; preliminary examinations have in most cases been made, and the work to be done will be pushed as rapidly as possible.

INCREASE OF TOURISTS IN THE NATIONAL PARKS

REPORTS received by Secretary Lane from the Superintendents of the various National Parks in the West, administered by the Department of the Interior, indicate that during the park season just closed there has been a great increase in the number of tourists visiting these great playgrounds. In Yellowstone National Park in 1914 there were 20,250 visitors, and this year two and one-half times as many—51,820. Yosemite National Park in California was visited this year by over twice as many people as entered its gates last year, 31,642 names being recorded during the season as against 15,145 last year. Again in Mt. Rainier National Park there has been an increase in the number of visitors of over 100 per cent—34,814 in 1915 as against 15,038 in 1914.

Secretary Lane declared the policy inaugurated two years ago of permitting automobiles to enter the parks to be a success, and that it would be continued in the future. In Yellowstone National Park automobiles were admitted for the first time on August 1. They operated under a very carefully worked-out schedule which has proven to be very satisfactory. The Park was visited this season by 958 cars, carrying 3,513 people, which points to a much fuller enjoyment of the wonders of Yellowstone National Park by motorists next year.

Ornamental and Shade Trees

A Department for the Advice and Instruction of Members of the American Forestry Association

EDITED BY J. J. LEVISON, B.A., M.F.

Arboriculturist Brooklyn Park Department, Author of "Studies of Trees," and Lecturer on Ornamental and Shade Trees, Yale University Forest School

PARKS AND THE PUBLIC

MUNICIPAL parks and the trees on our streets are not, as is generally supposed, intended for the mere pleasure of the people. In many respects they play as important a part in the development of the citizen as any other of the mediums purposing his betterment. What a wonderful training school the parks could be turned into for the development of character, for training the observative powers and the aesthetic judgment, for physical improvement and for inspiring the youth with a love for all that is wholesome and refined.

Much as has already been said about the influence of city trees and parks on the public welfare, trees as an aid to public health is a subject which has been discussed

quite often and hardly needs comment here. Trees as an aid to the city beautiful needs no argument when one but glances at the accompanying photographs. Buildings and bridges can only be made a part of a beautiful landscape when properly set off by trees and shrubs, but cannot be made the principal feature of a charming landscape without the trees and shrubs.

The value of trees to the citizen has even been discussed from the educational and moral point of view. But wherein the park and estate superintendents and city foresters can be of help in bringing the trees and shrubs in closest touch with the public has not yet been discussed to any extent and this is the object of the following lines.

The program for the park authorities is a wide one and



A BRIDGE IN THE HARTFORD, CONNECTICUT, PARK

This scene is especially valuable in demonstrating the adaptation of a simple rustic bridge to the rural landscape. Any other form of bridge—an iron bridge with its hard outlines, or a marble bridge with its bright coloring, would detract from the view instead of adding to it. This bridge adds to the charm of the landscape and forms a part of it.



A BEAUTIFUL VIEW IN THE HARTFORD, CONNECTICUT, PARK

This is an excellent example illustrating the value of vistas in park development. Deep vistas in any planting give depth to the scene and afford the observer the opportunity to satisfy his natural desire for long perspective and indefiniteness of distance. Most of the fundamental principles of landscape gardening are embodied in this view. The unity of the picture as a whole and the great variety in composition, material, texture and surface treatment are striking features of this scene. Water in any form is always very pleasing and in this particular form it helps to make the scene more restful. The arrangement of the plants is very good. The specimens in the foreground are adequately low and neatly kept. In the middle ground are the medium-sized trees, and in the rear are heavy masses of large-sized trees.

I venture to cite some of the means by which park officials may stimulate a proper appreciation for the beautiful and a keen sense of regard for the parks. I know that I will be cannonaded by many park commissioners and park superintendents, who will say that this is impossible of accomplishment, that many citizens lack that sense of appreciation and will insist on making cow-paths across lawns, that children are imbued with a destructive instinct which prompts them to break the leaders of newly planted evergreen trees, and that the average citizen does not give a care about the name of the tree he so often stops to admire. I grant that these conditions do exist. I witnessed them in our own city. But how are we to overcome them? Is it possible to overcome them, and to whom should this duty be charged? I maintain that it is possible to overcome them and that it behooves the park authorities to do it. People are not possessed of an innate tendency to destroy, and children do not necessarily seek an outlet for their surplus energy in the ruination of property. The whole question merely offers an opportunity for a practical lesson in civics, in the development of good taste and for the instilling of a genuine love for all which is beautiful and close to nature. It will require patience and will probably entail the loss of considerable material—I mean trees, shrubs, and flowers. But that

would really be a small loss completely justified by the results. We would not expect to teach any practical lesson in a laboratory without a sacrifice of demonstrative material. Why then expect a different disposition of the park material—nature's laboratory—when it becomes necessary to teach a lesson in civics. Of course, we cannot afford to make constant sacrifices and still have well-kept parks. But it is a condition we have to face at one time or another, and until we have taught the lesson we must bear the losses cheerfully.

Here is what may be done to make our parks attractive: The usual means are tennis courts and facilities for football, field hockey and croquet, golf links, musical concerts, rowing, merry-go-rounds, indoor flower shows and outdoor flower beds, shelters, refreshment stands, and seating, driving and riding facilities.

The modern parks, however, have gone a bit further and have done the following: They have labelled their trees, removed the keep-off signs, circulated information about trees and landscape features of the parks, introduced park concerts, lectures, moving-picture shows, story-telling meetings, public refreshment stands and exhibits.

This close relationship between good citizenship and proper environment is so rapidly being recognized that



A PART OF THE HARTFORD, CONNECTICUT, PARK SYSTEM

Here the interesting features are the broken skyline, the variety of texture in the foliage and the partial concealment of the buildings. The skyline carried high by the mass of trees and accentuated at another point by the tower exemplifies sound principles of landscape gardening. The weeping willow in contrast with the coarser foliage of the neighboring shrubs and trees add much interest and the careful planting around the buildings brings them out just enough to help the scene without making the architectural feature out of place in its quieter surroundings.

the old-fashioned idea of furnishing the citizens with set and artificial gardens is fast disappearing and instead many communities are acquiring vast ranges of woodland, mountain, lake and river scenery and placing at the disposal of their citizens these community forests, amidst which they may roam at will. In the acquisition of these parks the object sought is not the formal promenades, but spacious areas in which the public can lose itself, forgetting for the moment the restrictions of city life and reveling in the largeness of nature. Formerly our conception of a park has been, in many cases, as a storehouse for elaborate buildings, ornamental cut stone and floral designs. Such parks do not afford the rest, inspiration and refreshment which the city-wearied senses need so much. In such parks the city dweller cannot find the relief for his mind and body which could be found in the poetic charm of the quiet woodland or the rural landscape.

There are times when the formal and costly park is a necessity. Small city squares must be more or less formal in design and they are, of course, very necessary to every city of considerable size. But there are also strong arguments in favor of the woodland park. The woodland park in this country is a comparatively new departure in park development, but the charm of nature in the simplicity of its woodlands is not new. All we

need to do is to apply our forestry principles to the handling of these woods and collect that which nature might scatter and we are sure to have a woodland park far more attractive and wholesome than the formal garden. The cost of starting and maintaining a forest park is also far less than the amount required for a similar area of formal park. There are only a few forest parks in this country, but while our cities are still young it is possible for them to set aside small tracts of woodland in their suburban sections at a small cost and within a few years they will find themselves the possessors of ground not only worth many times the original cost, but also of inestimable value to the health and development of their citizens.

QUESTIONS AND ANSWERS

Q. Almost without exception, the shade trees in this city are trimmed in the early Spring and the trimming consists of cutting back all the large limbs. The shade trees in this locality seem to grow much faster than the same trees in the East. The box elders, hard and soft maples, black locust and poplar all send out such long shoots in a year that it is difficult to shape the tree by trimming, so the trees are cut horizontally through the center of the crown, the result being a lot of sprouts from the stubs of the limbs, making a very hideous tree,

especially in winter. Can you suggest the proper way to trim these trees and still prevent rank growth of new shoots?

Will you tell me why the trimming should be done before the leaves fall? Is not the winter just as good a time as early fall?

D. P., *Boise, Idaho.*

A. Box elder, locust and poplar trees lend themselves to severe and frequent cutting. They grow so fast that unless they are cut in they become either too tall or too thin and are liable to break in wind storms. The cutting, however, need not be done too frequently. All that is necessary is to control the crowns whenever they become too tall or sparse looking. This will prevent their appearing so stubby. Maple crowns should be kept compact by an occasional light clipping from the tips inward, but they should not be headed in, as you describe, unless they are very old and failing. Silver (soft) maples will require more frequent cutting than the other maples. The sugar maple should be cut but very little, if any. We suggested trimming ornamental trees in the Fall as a general policy because in that season the dead branches can be distinguished from the live ones with more certainty and ease and the climbing can be done with greater safety and ease than in winter when the branches are brittle and slippery.

Q. I would appreciate it if you could give me some information relative to the most desirable sprays for various tree diseases or insect attacks, or refer me to some article or book on the same. I also would like to have your opinion as to the most desirable spacing for street trees, such as elm, hard maple, etc.

W. W. M., *Chicago, Ill.*

A. It would hardly be practical to give you a complete list of all the spraying materials and the proportions in which they are to be used. This would vary so much with the character of the insect and the time of application that in each case you should have specific advice from your local State Entomologist or from the Department of Agriculture. There are a number of good publications relating to the particular materials and their applications, issued by the United States Department of Agriculture, by the New York State Department of Agriculture, and by the various experiment stations throughout the States. "Studies on Trees," published by John Wiley & Sons, New York, as well as "Shade Trees in Towns and Cities," issued by the same publisher, are suitable books for you to read. "The Care of Trees in Lawn, Street and Park" is one of the best books you can read.

As to spacing trees on city streets, I would suggest that for most species a space of 30 to 35 feet should be allowed, and for the American Elm 60 feet is appropriate.

Q. Last June the greater number of the trees on my farm in New York seemed to be suffering from the attacks of one sort of insect, pest or another. The elms and young hickories seemed most affected. The oaks and maples showed leaves badly chewed.

G. R., *White Plains, N. Y.*

A. It is difficult to determine the exact cause without an examination of the insect or at least the affected leaf or twig. If the character of the injury is eating of the leaf, then the tree will have to be sprayed with arsenate of lead. The exact time for spraying will depend on the kind of insect. If the injury is due to a boring or sucking insect, the treatment will again be different and in each case will depend on the exact nature of the particular insect in question.

Q. Can you tell me about an efficient insecticide for fruit trees?

G. A. F., *Richmond, Va.*

A. As a result of extensive tests during 1912, 1913, and 1914 with different insecticides, the entomologists of the United States Department of Agriculture have found that calcium arsenate, a new insecticide, gives very promising results in the control of certain insects that do damage by chewing on fruit trees. Among the chewing insects against which the arsenate of calcium proved effective, in laboratory and field tests conducted at Benton Harbor, Mich., are the codling moth, the fall webworm, the tent caterpillar, and the tussock moth.

In these tests the effects of arsenate of calcium, both alone and combined with lime-sulphur solution, were tested in comparison with arsenate of lead alone and in combination with lime-sulphur. The arsenate of calcium, as was the arsenate of lead, was used at the rate of 2 pounds to each 50 gallons of water. In all the experiments the arsenate of calcium gave very satisfactory results in killing the larvae without burning the foliage. In a number of cases its killing action was somewhat slower than, but compared favorably with, the arsenate of lead. Since it can be produced more cheaply than the lead arsenate, it would appear to have distinct value, although it has not been sufficiently tested to permit recommending it unreservedly for general use. Where arsenate of calcium was combined with lime-sulphur it was, as a rule, even more effective as a poisoning agent than when used alone and did not lessen the value of the latter as a fungicide. When these compounds are combined, the amount of foliage consumed by the larvae is less than where the arsenate of calcium is used alone.

Q. Please mention a few shrubs and trees most suitable for underplanting in a bit of natural woodland in the vicinity of New York City. L. P. R., *New York City.*

A. You should resort to native shrubs and trees of the following species:

Shrubs—Spice bush, viburnum acerifolium, junberry, red-berried elder, viburnum prunifolium, New Jersey tea, viburnum cassinoides, sweet pepperbush, mountain laurel, rhododendron.

Trees—Hemlock, beech, dogwood.

Q. What is the best way to gather the eggs of the Tussock moth caterpillar? P. C. C., *Waterbury, Conn.*

A. Collect them by hand picking wherever possible. Where the trunks of the trees are heavily covered with them and where there are many trees in question, place

a dark canvas cloth at the base of the trees and scrape off the egg masses by means of a wire brush. Then collect the egg masses from the canvas cover and burn them.

Q. When is the best time to plant my willow hedge and poplar screen, also tulip and sweet gum?

M. A. S., *Harrisburg, Pa.*

A. Willows and poplars can best be planted in the early spring. Tulip trees and sweet gum can be planted best in spring.

Q. When is the best time to set out evergreens?

J. P. E., *Baltimore, Md.*

A. Early spring is the best time, though the latter part of August is almost equally good.

Q. What shall I use to paint tree wounds?

A. L. L., *Chicago, Ill.*

A. Use refined coal tar, and if too thick, thin it down with creosote.

Q. I am much interested in the article referring to Common Sense Tree Labels in American Forestry. I wish to learn if these enameled labels may be purchased for private use and from whom.

H. M., *Boston, Mass.*

A. Such labels may be secured from E. George & Company, 194 Front St., New York City; Standard Sign Mfg. Co., Pittsburg, Pa.; New York Stencil Works, 100 Nassau St., New York City; and the Ingram Richardson Co., 100 William St., New York City.

ADVICE FOR DECEMBER

1. Fertilize, with well-rotted manure, all the weaker trees on the lawn and some of the shrubs that need encouragement. Apply the manure either as a top dressing or else dig in lightly with the soil. Apply to a radius equal in distance to the spread of the branches.

2. Insert bolts in trees that have a tendency to split. Most splitting occurs in January and February, and some species, like lindens and elms, have a greater tendency to split in the crotches than other species. Do not resort to bolting unless absolutely necessary, because a bolt generally detracts from the beauty of the tree.

3. Cut down all the marked trees and burn the infested wood.

4. Look over your spraying apparatus and tools and make all necessary repairs in preparation for the spring season.

NOTES

Many authorities believe that filling tree cavities with concrete is wrong, that such fillings are not permanent, that the concrete cannot be waterproofed and soon cracks and leaves a worse condition than no filler.

C. H. Hoyt, of Cleveland, O., writes that he has been several years perfecting a method of using the asphalt method and has solved the problem by making it easy to use and getting perfect protection at very small cost.

He has recently issued an illustrated folder on this method, which can be had for the asking.

On October 1, 1915, all the Boy Scouts of Mount Vernon, N. Y., assembled at the Presbyterian Church and heard a detailed account of the life history of the Tussock Moth, one of our worst shade tree leaf feeders. This insect overwinters in the egg stage and from fall till spring the eggs may be found in small white clusters firmly attached to the bark of trees and protected places along fence rails and under the house mouldings. Each troop was assigned a definite section of the city and each section was further subdivided for the individual Scouts, so that the entire city might be covered. For nearly three weeks the boys scouted around gathering the egg masses and then the territory of each troop was shifted so that the work might be checked up, triple credit being given for eggs collected during this checking period. Upwards of a quarter of a million eggs were collected by the scouts during the contest, and it would be difficult to state in dollars and cents the value of service so rendered to the city.

FOREST ITEMS FROM HAWAII

A FOREST and grass fire late in August burned over several hundred acres on the U. S. Military Reservation on the Island of Oahu, Territory of Hawaii, before it could be completely extinguished by 2,500 regular troops from Schofield Barracks who fought it with difficulty on the steep mountain slopes with wet bags.

In the work of reforestation with indigenous trees the open areas on the watershed back of the city of Honolulu, which was begun two years ago, the Division of Forestry of the Territory of Hawaii uses imperfect cans which are discarded by the hundred at the pineapple canneries and may be obtained free of cost. One seedling is raised in each can which first is split up the side and the bottom almost completely cut around. The can is held together with a wire. At the planting area, the wire is removed, the can opened up and the seedling taken out with a complete ball of earth around the roots. Superintendent of Forestry C. S. Judd reports that by this method almost perfect success is obtained from the planting. The cans can be used three or four times for this purpose.

The old royal Hawaiian palace in Honolulu, now used for the executive offices of the Territory, is receiving a new flooring of native ohia wood. This is logged and manufactured at Pahoa, Hawaii, by the Hawaii Hardwood Company, which operates the only sawmill in the Islands.

During 1914, a little short of one million trees were planted in different parts of the Hawaiian Islands for ornament, windbreaks, and fuel. Species of the Australian eucalyptus are used for the latter purpose and grow so rapidly that they can be cut six years after planting. Many of the species sprout readily from the stump.



MEDAL PRESENTED TO THE AMERICAN FORESTRY ASSOCIATION BY THE PANAMA-PACIFIC INTERNATIONAL EXPOSITION AT SAN FRANCISCO ON AMERICAN FORESTRY ASSOCIATION DAY, WEDNESDAY, OCTOBER 20, 1915

Medal for the Association

DIRECTORS of the Panama-Pacific International Exposition at San Francisco presented a handsome bronze medal, reproduced here in actual size, to the American Forestry Association during its meeting there on American American Forestry Association Day, Wednesday, October 20. The presentation was made by Mr. C. S. Scott, representing President Charles C. Moore. Mr. Scott referred to the very important work the Association is doing in forest conservation and in educating the public in a love and knowledge of trees,

and the great value of such a public spirited work. He declared that in behalf of the Exposition he wished to present the medal as a token of the appreciation with which the people of the entire country view the efforts of the Association and in the hope that it would receive continued support.

The medal was received by Dr. Henry S. Drinker, president, who said the Association accepted it as an incentive to further efforts in the great national service which it is doing.

Three Resolutions

THE following resolutions were passed by the Western Forestry and Conservation Association during the recent Forest Industry Week at the Panama-Pacific International Exposition in San Francisco:

ENDORSE AMERICAN FORESTRY ASSOCIATION

We desire to express our appreciation of the American Forestry Association, and the excellent work it is performing and particularly commend its participation in the proceedings of this conference through the presence of its officers and members. We urge upon all of our members the need for actively supporting the American Forestry Association to the end that a great national movement may go forward with every possibility of further material accomplishment.

WEEKS' LAW APPROPRIATION

We have found the allotment of funds under the Weeks' law for the protection of forested western watersheds outside the national forests to be perhaps the most practical and effective means not only of stimulating state effort, but also of cementing private, state and federal protective effort into a harmonious and efficient whole. Its value to the Government in these ways is immeasurably beyond its cost. We plead earnestly that it be considered an experiment no longer and that it be made a continual annual appropriation. We pledge our cooperation and support to insure its economical and advantageous expenditure.

We endorse the recommendation of the Secretary of Agriculture that further appropriation be made for the purchase of additional lands at the headwaters of navigable streams in

the White Mountains and the southern Appalachian Mountain and instruct the secretary of this association to request our members to urge the senators and representatives from their several districts to support this measure.

COMMEND FOREST SERVICE

We commend the excellent work of the Forest Service in protecting the national forests as far as its funds permit and especially in developing progressive methods as a contribution to the modern science of fire prevention. We not only speak for the entire forest interests of the west in urging upon Congress to provide liberally for national forest protection, but also believe we are competent to testify as experts to the country at large that greater expenditure for this purpose is necessary to safeguard its forest resources properly.

Children's Department

Devoted to imparting information about trees, woods and forests to boys and girls so that they may grow to know how necessary trees are to the health, wealth and future of their country.

By BRISTOW ADAMS

THREE TREES

ONCE upon a time, a long while ago—for that is just the way that all Christmas stories begin—three trees stood fairly near together in the forest. But before we begin, let me make it clear that this is a fable. It is true, with variations.

The three trees were blood brothers, and they had grown for a number of years; but because of the conditions under which they had started, each one had developed a different character; one might almost say that each had developed a soul.

One of them—the tallest—had started in good ground. Straight above him there was an opening in the crowns of the tallest trees around. Just at noon a shaft of sunlight came down through this opening in the leaf canopy, and the tree lifted its head up toward the life-giving light, and grew straight, tall, and slender, with a long space between each annual whorl of branches.

The second tree had a much harder time of it. It was more crowded by the other trees, and it had to start in a rocky place. So it grew twisted, and knotty, and cross-grained; it had no decided aspirations and it therefore did not get any place in particular.

The third tree, the smallest of all, started in rocky ground, but there was more than enough sunshine, because of a big opening all around it in the forest. This little tree rejoiced in the light; it spread out all of its arms to welcome the brightness, and was indeed able to develop new arms, or branches, because it had so much sun.

AT the time this story begins, it was nearly Christmas and the branches of the three trees were laden with snow. The slender limbs of the tallest tree did not afford much of a resting place for the snowflakes, so that even in winter it was not in much danger of being broken down. The gnarly tree held some snow on one side, which made it even more twisted and bore some of its limbs down to the ground. The little tree was covered all over evenly, and its sturdy little branches readily held up the white mantle.

Two small boys came trudging through the woods looking carefully from side to side as if they were searching for something. They came first to the tallest tree, and the smaller lad suggested that they cut that one. But the larger boy thought otherwise, and explained that when it was brought into the house to be used as a Christmas tree there would not be enough close branches to bear the ornaments and to hold the candles. You have guessed by now that these two boys were looking for a Christmas

tree. You have also guessed that they could not take the gnarly tree, because it was crooked, and that their eyes alighted on the little tree with glee, for it was just the kind they wanted.

So the little tree was borne away and made a whole household happy with its greenness and its sturdiness and its exact fitness for the purpose for which it was intended. It stood in the midst of the living-room, and the children danced around it with shouts of joy. And upon the walls there were festoons of what is variously called crow's foot, or running cedar, or ground pine, or lycopodium. There were wreaths of holly in the windows, and at night a candle burned above each wreath and lighted the snow outside the house. There were colored prints from Christmas editions of the illustrated London papers, and over the fireplace the father of the household had lettered a motto intertwined with yule-tide designs in green, red, and gold:

"God blesse ye mastre of thys house,
And eke ye mistresse too,
And all ye litel childrenne
Thatte rounds ye table goe."

The little tree was glad because it had given service where it was best able to serve. If it had thought into the future it would have known that it could not serve mankind by being made into lumber for his needs, for each one of the many limbs would have meant a knot in a board.

AND what became of the other trees? They grew on for many years, and the crooked tree grew crookeder because it had got into the habit of doing so, and it became more gnarled, knotted, and cross-grained. Because it was crowded and elbowed by its neighbors, and because it had lost the power to reach up and hold itself straight, it finally gave up in despair and became a decayed, unsightly object in the forest.

The tall tree kept growing, and reached up for its spot of light. It knew as well as a tree can know, that if it did not reach that opening above it before the larger trees had closed in that it might as well give up, too, then and there. Finally some lumbermen and foresters went through the woods selecting the trees which should be cut, and those which deserved to be left to continue growing. The tall, straight, slender tree was growing so well that they left it and made use of some of the older ones around, taking care when they felled the others that they should not injure the slender one. When they had taken out the trees which they thought should be cut, and

cleared away all of the waste material in the woods, including the poor gnarled tree, the slender one found that it had all sorts of room and light to grow in, and it set itself lustily to the task of growing. It continued to grow tall and straight, but it began to lay on thickness and to increase its strength and girth.

Some years after that it was time for some more of the trees to serve man's needs, and this time they took the tall straight tree. It was so tall, so straight, so smooth-grained and strong that they selected it for a special purpose. It went to the shipyard and there was made into a round, towering mast. It sailed over all the seven seas, helping to bring delightful things from one part of the world to those who wanted them in another part.

It helped to carry gifts to the old home where the little Christmas tree had stood, sugar, and fruits, and coconuts from the tropics, coffee from Brazil to the "master" of the house, and tea from Ceylon to the "mistress," and from China a big lamp for the table, 'round which the "children" used to "goe." From Italy had come a little bronze statuette of a Greek athlete, who was on one side of the mantel, where the Christmas motto had been. He was straining to throw a discus as far as he could. On the other side, from Japan, a little fat, calm, bronze Buddha sat with his feet crossed under him, and his hands held passively in his lap. From Occident and Orient, each according to its spirit, the tall tree had helped to bring them.

You can believe this story or not, just as you choose; but the forest part of it is true at least. If it sets you to thinking that every life can be made useful, each in its own way, if one will only try, no harm has been done.

FAMOUS TREE SURROUNDED BY PAVEMENT

IT IS always an amazing sight to see a great tree growing out of a crack in a rock, especially if it may have split off a boulder of granite which the strength of a dozen men could not budge. There is in fact eternal warfare between the mineral and the vegetable kingdoms. Rocks and boulders may appear grim and immovable, but their cracks and crevices are eternally being searched by the pliant growth of plants and trees and in the end they always succumb to the attacks of their weaker enemies. For all time this continual battle has been going on, each generation of the plant world doing its share, apparently serene in the knowledge that when it dies its place will be taken by another plant which will continue the conflict.

While the ability of trees to grow and thrive in rock soil, or perhaps in rocks where no soil is visible, has probably been noticed by most everyone, there is perhaps no more striking evidence of this than can be seen in most any large city where the streets are paved with concrete or asphaltum. The city of Washington, for instance, has dozens of large and thrifty trees which are growing in little plots of soil not much larger than flower pots. Illustrating this is the photograph of a large elm tree which has stood in front of the Willard Hotel on Pennsylvania Avenue since long before Civil War times.

When the tree was first planted the street was paved with cobble stones and the sidewalk was of ordinary porous brick, so that with a plentiful supply of moisture soaking through on all sides the tree might have been expected to thrive. But for the last 30 years the street has been paved with impervious asphaltum and for the last 18 or 20 years the sidewalk has been paved with equally water-



HOW DOES IT GET WATER?

This elm in front of the New Willard Hotel at Washington, D. C., is on a street paved with asphalt and a sidewalk of concrete. It thrives despite the fact that apparently it gets very little moisture.

tight concrete, through neither of which a drop of moisture can penetrate. All the moisture that this great tree can get must come via the small square of earth which its trunk nearly fills, and which would seem hardly sufficient to nourish a good sized shrub.

This old tree has witnessed many famous historical scenes. It has seen the marshaling of the Federal hosts at the first call to war in '61; the passing of the proud columns of McClellan toward the battlefield of Bull Run and their sorry return, and finally, when the great conflict was ended, the Grand Review of the battle-scarred veterans of Grant, Sherman, and Sheridan, and very recently the veteran remnant of that great army. It has seen many Presidents of the United States pass to and from the White House on their way to the Capitol to take the oath of office and to surrender the reins of government and, judging from its sturdy appearance today, it will see many more.

WHITE PINE THREATENED

FOUR recent serious outbreaks of the white pine blister rust on currant bushes in Massachusetts and New York have called attention sharply to the alarming character of this disease and the economic loss which it threatens in the northeastern and western United States unless it can be brought under control within the next two years. This disease has been known for some years, having been introduced at many points on white pine nursery stock imported mainly from Germany. The disease first established itself at Geneva, N. Y., in 1906. In 1909 extensive importations of diseased white pine nursery stock were located and destroyed in New York and other eastern states and warnings issued broadcast against further importation of white pine from Europe. In spite of these warnings importation continued even from the particular nursery in Germany which was definitely known to be the main source of disease, until finally in 1912 all such importation was stopped by Federal law. Whether this law was passed too late remains to be seen, as it depends on whether the disease already established in the United States can be stamped out.

The white pine blister rust affects the eastern white pine, the western white pine, the sugar pine and, indeed, all of the so-called five-leaf pines, producing cankers on the stems and branches, killing young trees and maiming and disfiguring old ones. It also produces a leaf disease of currant and gooseberry bushes. The fungus causing the disease must live for a part of its life on pine trees and part of its life on currants and gooseberries. The disease cannot spread from one pine tree to another, but must pass first to currant bushes and then back to pine.

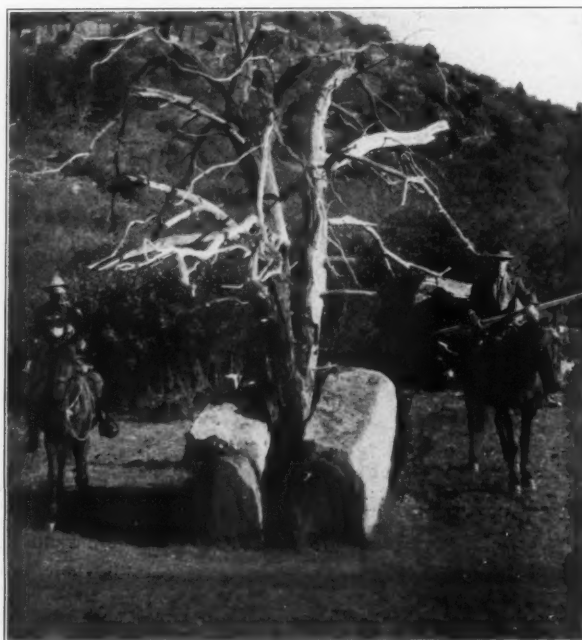
In Europe the disease has made the culture of American white pine impracticable in England, Denmark, and Holland, and has seriously handicapped its cultivation in Germany. Since the trees which it attacks include three of the most important timber trees of the United States, the loss which this disease will produce if unchecked is uncalculable. Fortunately, the disease is not now known to be present west of Buffalo, N. Y., but its ultimate spread to the vast forests of the Rocky Mountains and the Pacific Coast is certain if it is not checked in the eastern states. The disease now occurs in three localities in New Hampshire, two in Vermont, two in Connecticut, five in New York, one in Pennsylvania, and three in Ontario, Canada. At one point in Ontario, two in New York, two in New Hampshire and two in Massachusetts, the disease is present on currants in sufficient quantity to be serious.

The disease is controllable at this stage by the destruction of the diseased white pines or the complete destruction of all currant and gooseberry bushes in the vicinity. Whether or not this simple action can be accomplished depends upon the legal authority possessed by the various

state horticultural inspectors concerned. If the inspector is not armed with authority to destroy either currant bushes or the few diseased white pines with or without the consent of the owner, all efforts at control will be unavailing, as a single person, by permitting diseased pines or currants to remain on his place can nullify the work of an entire well-disposed community. The immediate issue, then, is whether the several states will see that their inspectors have sufficient authority or whether still another imported disease shall be added to the already long list of undesirable fungus and insect immigrants, and the white pines of the United States be reduced from their present high standing to that of inferior trees.

PINON TREE SPLITS LARGE ROCK

THE great rock-splitting force of a growing tree is shown in the photograph of a piñon tree in the Mesa Verde National Park, of the State of Colorado, at the head of Prater Canyon. The tree is dead



ROCK SPLIT BY A TREE

The force of a growing tree is illustrated by this picture of a piñon tree. The rock is deeply imbedded in the earth, yet it was split by the growing tree.

now, but this is due to old age, not to any squeezing of the stone. The tree made a full and healthy growth, bearing doubtless many bushels of piñon nuts, and gradually widening the crack in the rock as its trunk required more and more space. The power exerted by the tree is all the more remarkable as it is evident that the sandstone boulder is embedded in the earth to a considerable depth.

Wood Preserving Department

By E. A. STERLING

Wood Preserving Experts to Meet Next Month

THE twelfth annual meeting of the American Wood Preservers' Association will be held at the Hotel Sherman, Chicago, January 18, 19, 20, 1916. The program will be devoted largely to the reports of standing committees on Preservatives, Specifications for the Purchase and Preservation of Treatable Timber, Wood Block Paving, Plant Operation, and Service Tests, the latter under the three divisions of cross ties, wood block paving and bridge and structural timber. In addition to the committee reports, addresses and papers will be presented on pertinent subjects. Full information and advance copies of committee reports may be obtained before the meeting from F. J. Angier, Secretary-Treasurer, Baltimore, Md.

In addition to the many activities in the way of establishing standard practice in the use of preservatives and treating processes, and in keeping the industry informed of progress and developments, the American Wood Preservers' Association publishes a house organ, *Wood Preserving*. This is edited by C. C. Schnatterbeck and is issued quarterly under the direction of the Executive Committee. It contains much of interest to all who are interested in any phase of wood preservation, the subscription price being only \$1 per year.

As an indication of the growing general recognition of wood-preserving possibilities outside of the fully established fields of railroad ties, bridge timbers, marine work and wood-block paving and flooring, the question of its application to retail uses was thoroughly discussed at a recent meeting of the Southern Pine Association and Retail Lumber Association Secretaries. While many difficulties arise in attempting to distribute pressure-treated lumber in retail yards, it was the opinion that at least a start should be made by promoting the local use of suitable preservatives for brush treatment, and by the installation of open-tank facilities in connection with retail yards. With this, of course, would have to be proper education of the consumer as to why treatment is advisable and how to apply it to best advantage.

From the standpoint of the average consumer, really more has been expected of wood and less done to help it serve a great variety of uses than almost any other building material. It is a comparatively modern conception that proper preservative treatment is practical and economical on the farm and around the home. Good paint is a good friend of lumber, and while not usually con-

sidered in that light, is the one protection against the natural progress of decay which has been universally used. Yet the well painted house has unprotected floor beams in moist walls, door steps on wet ground, and many inside surfaces and timbers which are continually exposed to conditions favorable to decay. The wonderful service which wood has given during all the years, with meagre or no thought to the factors which destroy, brings into greater prominence the possibilities of preservative treatment under the present day desire for permanence and elimination of waste. No one expects unprotected steel to do anything but rust, concrete is waterproofed and its surface protected from abrasion and disintegration, fabrics are shielded from the elements, while wood has largely been left to shift for itself. The application of wood preserving methods to the every day uses of lumber, where it needs protection from decay, is in keeping with modern ideas.

Closely related to preservative treatment against decay is the development of fire retardant materials and processes, particularly for shingles. While only 27 per cent of all fires spread to adjoining buildings, and individual carelessness and character of contents, rather than the material of which buildings are built, are responsible for most fires, it is an additional measure of safety to have fire retardant shingle roofs. Dr. Herman von Schrenk, who has for several years been testing all available materials, recently announced that the long search for a satisfactory fire retardant was practically ended. Materials have now been found which effectively protect shingle roofs from sparks and brands, and prevent the spread of a fire on such fire-proofed wood. Almost simultaneously the Forest Service announced the development of a fire-proofing chemical. These same materials, in most cases, act to prevent decay as well as fire.

DOMESTIC WILLOW CULTURE

In view of the present war in Europe and a consequent cessation of most of the hitherto imported supply, domestic willow culture has within a year assumed an importance which it has not had before. Planting already done in Maryland points to willow culture as a successful enterprise, of which a study and report are at this time being made. The study should result in better methods for the grower, and it is the aim of the report to give such information and encouragement to both present and prospective planters in this State as may induce them to take advantage of existing opportunities in osier culture.

Editorial

THE BUSINESS SIDE OF FORESTRY

FORESTRY means different things to different persons. Each individual is interested most directly in the things which in some way add to his personal enjoyment or income. The forest contributes to our welfare in three distinct ways: first, as trees and woods to be enjoyed by the eye and as breathing spaces for recreation and escape from civic confinement; second, as a great protective mantle to preserve our mountain slopes, regulate the flow of streams and ameliorate the climate; third, as a source of wood for the many and complex needs of our modern civilization.

At first glance, this last object is utterly opposed to the first two. Instead of forest preservation, it calls for forest destruction—for how else can wood be obtained than by felling the forest? The strong appeal which sentiment makes to the town-dweller thus tends to array him against the economic use of wood and in favor of exclusive devotion of the woodland areas to the single purposes of recreation and protection. Yet if this theoretical conception should be practically applied, resulting in the cessation of the use of wood, an industry occupying second rank in value of output in the United States and representing an investment of over six billion dollars would be paralyzed, 700,000 men forced to seek other employment, and untold suffering and privation caused to millions of our people. So extensive and intimate is our dependence upon wood products that there is not a man, woman or child whose comfort and well-being would not be directly and materially injured by such a calamity.

When the facts are faced, no one can honestly oppose the felling and utilization of the forest as an abstract proposition. But short-sighted and zealous nature lovers, putting their personal feelings before their common sense, actually and whole-heartedly believe that forest "destruction" is an unmixed evil and that every acre consecrated to perpetual "preservation" free from the ax is so much clear gain for human welfare. So we have the spectacle of a great state devoting 1,800,000 acres of wild and largely inaccessible land to perpetual wilderness, and by constitutional restrictions preventing the utilization of the timber.

But this sentiment is not altogether blind. The public have for generations witnessed the effects of lumbering on privately owned lands, by men whose acknowledged object was to strip the land of all forest values and then abandon it to fire or taxes. "Destructive" lumbering had for its sole purpose the conversion of the raw material, trees, into products for the many uses and needs of our expanding civilization, at a cost which would leave a living profit. The conception of commercial forestry, the actual growing of trees to replace those removed, was looked on by these practical men as fantastically impossi-

ble. This conviction, although based on the soundest of business reasons, reacted to strengthen the sentiment of others in favor of preserving the standing timber from similar destruction, and furnished a psychological explanation of the outbursts of hostility to the lumber business which have tended to create an atmosphere of strain and resentment. Lumbermen feel that they are in most cases doing all they can afford to do for the forest. Their service to the public does not consist in growing the timber, but in bringing it to market in the form of useful commodities.

It is the misfortune of the lumbermen that in most cases they have been forced by necessity to acquire and own timber stumpage. The care of timber lands is a business in itself. Public welfare demands that these lands be kept productive—that timber crops succeed the present virgin forests. This the lumberman is ill-equipped to do. His investment, his training, his business, lie along wholly different lines. In most cases he can see nothing but financial loss in expending large sums upon tree planting, thinnings and other measures of forest production. We should not blame him; but we do. The sooner we realize our error, the better it will be for all concerned. *Forest production is a business in itself.* And it is not the business of the lumberman, unless he voluntarily chooses to undertake it. The growing of commercial forests is fundamentally a business for landowners, large or small, who intend to hold the land in perpetuity. If lumbermen could be guaranteed a sufficiently large and permanent supply of timber, they would be far better off if they did not own an acre of timberland, but purchased their raw material as they needed it, from the producers. This startling truth is just being realized in part by the lumbermen of the west coast today, who are being slowly crushed beneath the burden of carrying charges on vast volumes of stumpage, once eagerly acquired, and now hanging like mill stones about their necks.

We cannot escape the conclusion that the business of growing timber and of owning timber lands is one in which the public must be directly and largely interested and that one solution is offered by the existence and creation of national and state forests. The *American Forestry Association* stands primarily for forestry, which means the business of producing forests upon forest land, and any rational measures, public or private, which will further this economic result, will receive our unqualified support.

But economic forestry, or commercial timber growing, will never be profitable unless wood continues to be regarded as indispensable and the demand for forest products is maintained. The business of forestry is de-

pendent for its success upon the continuation of the great wood-using industries in just as real a sense as they in turn will depend upon forestry in the future to produce their raw material. Two paths are open: conservation through diminished use of wood, the encouragement of substitutes, and the resultant condemning to perpetual waste of all forest lands whose timber crop has been

cut or destroyed; or conservation through wider use of wood, the retention of wood as a primal necessity of commerce and civilization, and energetic measures to create and maintain the business of forest production to provide the wood for the future. The latter course means true forestry and to the accomplishment of these aims the Association will direct its efforts.

"Looking Squarely at the Waterpower Problem"

BY HENRY J. PIERCE

Reviewed by Henry Sturgis Drinker, President of Lehigh University

THIS treatise admirably and succinctly summarizes from the standpoint of the engineer and business man the waterpower problem in the West.

Mr. Pierce in this work has presented in a condensed yet very interesting and readable form—and with great fairness—the present status of the waterpower discussion in the West, speaking from the standpoint of the investor and development engineer. The book opens with the following foreword:

"Our refusal to develop our wasting waterpowers constitutes the strangest feature of our national conduct. For the greater part our waterpowers are idly wasting their energy. The reason is that we have not yet been persuaded to enact laws under which money may confidently be invested in them. Until we do this our waterpowers will be as useless to us as though situated on another planet."

This is followed by an address to the members of Congress and others in authority, in the course of which the author says:

"It is inevitable that the waterpower question must soon be dealt with by Congress. Unless that dealing is wise and business-like, the effort will be useless. As will later be shown, the waterpower business involves a multitude of investment risks. There are nearly 5,000 standard investment securities for sale in the open market. The waterpower business must compete for money with all of these other standard investments. It ought to be apparent that any waterpower law under which an invested dollar is inevitably doomed to depreciation will not encourage waterpower development.

"If, in considering legislation, our lawmakers, while protecting fully the public interests, will at the same time apply the homely and familiar rules of honest business and will searchingly test each section of a legislative bill by determining whether, under the terms proposed, they would be willing to invest their own money, or were they executors of an estate, the money held by them in trust, the path to power development and all its manifold benefits will be greatly smoothed."

The author has an enlightening discussion on the topic of "How the Nation Is Concerned" with this great question—followed by a further study of "The Practical Side of the Question," in which he summarizes the available water horsepower of the country, and its possible application when developed to many markets and uses, among them "The Electric Furnace," and "Transportation."

The eminently valuable, wholly original, and practical nature of this work by Mr. Pierce, centers mainly in his discussion of the pregnant question, "What are We Quarreling About?"—pages 25 to 34, which opens with this paragraph:

"More than one man who has, with open mind, investigated this national waterpower controversy, has closed his review by asking, 'What are they quarreling about?' Here is a controversy of about eight years' standing, which has prevented economic development in the United States to the extent of hundreds of millions of dollars. It has caused and is causing sectional discontent and suspicion where nothing but harmony and industrial cooperation should prevail. Some entire States feel that they are harshly and inconsiderately treated by the Federal Government—that they are being strangled by the hand of might. There is a widespread contention that the western waterpower States are being denied the sovereignty to which they are entitled under the Federal Constitution, and are having their growth impeded and are being impoverished because such large proportions of the lands in such States are withdrawn by the Federal Government for waterpower purposes. Such lands are not subject to local taxation, although the communities and States are burdened with the maintenance of the law on those withdrawn lands. There is bitter complaint that although those lands were withdrawn from sale or entry under the pretext that they would thereby be rendered readily available for power purposes and thus their use for such purposes would be facilitated and encouraged, yet present laws make it impossible to use them—laws of fulsome promise but of deadly effect.

"Such are the consequences. Yet strangely enough, the real differences between the contending parties are so small that it seems as if an hour's consideration by full-grown men ought to remove all cause of controversy. Therefore, is it not time that the leaders on both sides pause for a while and reason a little? Perhaps it will be found that some are continuing the quarrel merely from force of habit. Well, then, what are we quarreling about?"

This is followed by a series of questions by "Theory" and answers by "Practice," which should appeal to all true conservationists as a most fair-minded presentation of the whole matter, and as showing, as indeed was developed in Congress last year in the hearings on the Ferris bill, that there is today no great conflict of opinion on these matters, but only an apparent inability to get together frankly and with a mutual desire to end an unnecessary difference:

"Theory—You waterpower people can't have any more perpetual permits to build and operate dams on navigable streams, nor can you have any more fee titles to public lands which involve waterpower sites.

"Practice—All right; we gave up expecting such things long ago and have planned accordingly in our calculations for the future. We had supposed the policy was all settled; why do you keep on making speeches about it?

"Theory—Waterpowers must be developed under a permit or some form of term grant running, say fifty years, after which the people must have the right to take over the property.

"Practice—Are you going to pay us for the property when you take it over?

"Theory—Certainly, we shall pay the fair value.

"Practice—Good scheme—we're all agreed.

"Theory—But we are going to pay you only for the fair value of the property, and for no blue-sky stuff, like capitalized value of the permit and the Government lands occupied, goodwill, profits that you expect to get from contracts, nor anything that is not actually put into the property as a hard-cash investment or its equivalent.

"Practice—All right again—don't want to be paid for any blue-sky stuff.

"Theory—And we want you to make prompt development of the properties under permit and not to hold them unused for speculative purposes.

"Practice—Of course, we agree; and even if we didn't, the fact would still remain that money is too scarce and too valuable to throw around and leave idle in such a manner, even for speculative purposes.

"Theory—There shall be no artificial manipulation of things, nor any jockeying to the end that the consumers' rates shall be raised or that service be deficient or discriminatory.

"Practice—No; such things shall not be. Under modern practice the power business must be conducted on the large-volume and small-profit plan, which necessitates low rates and equal service. But even if this were not so, public regulation through commissions now established in nearly every State of the Union will prevent high rates and discriminatory service.

"Theory—Your consumers' rates should be as low as commensurate with a reasonable return to the capital actually invested, irrespective of stock issued.

"Practice—Certainly; just a reasonable return on the actual cash value of the property. The stock issued has nothing to do with the case, and is to be disregarded entirely, no matter whether it be represented by actual face value in the plant, or be watered to a million times that amount. This 'reasonable return on a fair value' idea, regardless of stocks or bonds, is universally an established principle in public utility regulation. A reasonable return has been well defined as the lowest return that will induce investors to purchase the securities of any particular investment. A larger return is unreasonable, and a smaller return will fail to get the investment capital. The only complaint that we have is that some of you people have selected public-land and navigable-stream power plants as subjects for strict regulation by the Federal Government, but do not propose to exercise such regulation over plants that happen to be located on private lands. Regulation is a great and necessary institution; it should be exercised indiscriminately and not concentrated on projects that happen to be located on sites either owned or controlled by the Federal Government. Private-land plants and Government-land plants should operate under exactly the same burdens and same laws."

Space cannot be taken here to quote the remainder of these questions and answers—nor those of "Practice" later addressed to "Theory"—but their study will be a good investment of time by those interested. The effect of this treatise is to enforce the lesson that the Government and those desiring to put money into waterpower

development are so nearly in actual accord that it would seem to be a comparatively easy task for a clear-headed business-like congressional committee to be able in the coming session of Congress to devise and recommend legislation fairly covering the situation. Nothing better emphasizes this than Mr. Pierce's words under his heading, "Who Pays for Unfair and Restrictive Legislation?" when he says:

"Who pays? No one but the consuming public. Well-meaning speakers and writers blessed with patriotic regard for the public welfare have thoughtlessly advocated many things, the effect of which would be to impede the progress of the waterpower developer, restrict his operations or prevent his exercising skill, enterprise or other goodly quality in the interest of his business. It will not be practicable to enumerate and discuss all such instances here, but everyone familiar with this subject will recall one or more. Those who propose such things do not need to take the word of anyone; let them get right down to fundamentals, use some good old-fashioned arithmetic, and they may prove to their own satisfaction that the consuming public pays and pays right well."

"The Waterpower Business and Its Risks" are well discussed by Mr. Pierce in a succeeding chapter, and in discussing the viewpoint of the banker financing a waterpower project, Mr. Pierce says—

"He must look beyond the fact of a paper offered as security for a loan. He must be satisfied that the maker of that security is able to sustain the obligations entered upon. He notes the waterpower hazards above discussed and he rightfully demands that if his clients must sustain these hazards they must, on the other hand, have a good title, a fair chance for an assured return of principal and reasonable interest and that the terms and conditions written into the franchise shall be definite and without unnecessary financial peril—that the occupation of the land is a matter of right and not of grace."

The chapter on "Waterpower Ownership and Control" and its intelligent discussion of the charges of oppressive monopoly—and that on "Waterpower Legislation" are illuminating and of great interest—and the author's final "Conclusion" is an admirable summary of the situation as it exists today. What could be said more plainly and in good, plain, common-people's English than the following—the concluding paragraphs of Mr. Pierce's treatise:

"Confidence in waterpower investments cannot be restored by mudslinging speeches and writings. We cannot hasten the day of waterpower development by calling each other fools or rogues, or by inciting class against class or by promoting prejudices. The man who is skillful enough to build and operate a waterpower and the man who is brave enough to finance it are surely deserving of reward, and they are not, by such acts, necessarily made over into thieves and oppressors as some would have us believe. On the other hand, the man who stands fast for a fair and righteous deal to the public is not a charlatan and a seeker for cheap notoriety, as others would have us believe.

"As has already been remarked, all parties are very close together. Some of the remaining differences are mere matters of terminology. Instead of 'bawling out' a proposal merely because it is advanced by a waterpower man, would it not be better to get beneath the surface and judge it upon its merits? Instead of scoffing at another proposal merely because a 'conservationist,' without waterpower experience, expresses it, let us see whether it does not have that estimable advantage of perspective. We want waterpower development as soon as possible, and it makes not a shade of difference who, in the controversy

of the past eight years, has been right and who has been wrong. The cause is bigger than any man or group of men. Let us forget the past and start new.

"We are sure of a few things:

"1. That it is not safe nor ultimately profitable to conduct an industry in a wrongful manner; this is one of the axioms of modern business and the successful waterpower business rests absolutely upon it.

"2. That the waterpower men do not expect to get from the Government more than is fair, and they do not expect to conduct their business in a wrongful manner. If they had other expectations or intentions, Congress would see to the one and public service commissions to the other.

"3. That there will be no waterpower development commensurate with the resources of the country unless congressional legislation will so safeguard development as to encourage investors to put their savings into waterpower enterprises and thus permit waterpower companies to obtain ample capital at reasonable rates.

"4. That Congress and the various State legislatures can control waterpower companies engaging in public service business—can control their rates and service—and it is not necessary to impose conditions hindering or restricting development and the acquisition of capital in order to insure fair treatment of the consumer.

"5. That every petty burden and every irritating limitation placed on a waterpower development for the purpose of 'protecting the public' is and must be paid for by the public. Therefore, in setting up these things for the public good, it is always well to ascertain whether or not some of the many obstructions really are for the public good and whether in each case the good derived is commensurate with the cost. It is only when the benefits equal or exceed the cost that such things are wise.

"6. Finally and most important—waterpowers on the public lands and on the navigable streams will always be commercially inferior to and will lag behind those developed on non-navigable streams and on private lands unless the conditions and stipulations governing the former are at least as favorable as those governing the latter."

The work closes with appendixes giving full reports and analyses of the national legislation considered by Congress at its last session—the Adamson Bill and the Adamson-Shields Bill, the Ferris Bill, the Jones Bill and the Works Bill.

YOSEMITE PARK IMPROVEMENTS

SECRETARY OF THE INTERIOR LANE has completed plans and signed contracts for hotel and camp and transportation concessions in the Yosemite National Park which insure its future along lines of development commensurate with its scenic and recreational value and in response to the new attitude of appreciation on the part of the American public toward their National Parks possessions. It is expected that half a million dollars will be spent in the Yosemite during the coming year in realizing these purposes.

Concessions have been granted to the Curry Camping Company for Camp Curry, to William M. Sell, Sr.; for Camp Ahwahnee, to William M. Sell, Jr.; for Camp Lost Arrow and to the Desmond Commissary Company, which operated a successful camp in the Valley last summer, for its continued operation and for other developments

from which results of interest and importance are expected.

In accordance with these concessions the Desmond Commissary Company will build a new and thoroughly modern hotel on the floor of the Yosemite Valley which will cost approximately \$150,000. Operations to this end will begin immediately, and, until completion, these concessions will operate the old Sentinel Hotel. The new hotel will inaugurate General Superintendent Daniels' plan for a new Yosemite Village to gradually replace the present village with one of beauty, unity of design and fitness to its environment. The same company will also build a hotel at Glacier Point which will cost approximately \$35,000. This point commands one of the noblest views in America, but so far has been accessible principally as a side trip to and from the Valley. This hotel will probably be ready for patrons during the coming season.

Four comfortable chalets will also be built for next season's use. Two of these will be located on the old Tioga Road which the Department of the Interior acquired and improved last summer and which Secretary Lane purposes to fully develop during the coming year. It crosses the Yosemite National Park north of the Valley forming a new highway over the Sierra and making access with cheapness and comfort to the hitherto inaccessible scenic beauty of the northern part of the park. These chalets will afford convenient stopping places for motorists and other visitors, thus enabling tourists to enjoy a part of the park which would involve prohibitive cost were these accommodations not made available. Another chalet will be built at Lake Merced and a fourth in the Little Yosemite. All four will have a thoroughly modern equipment and will be run in connection with the two new hotels.

Work on all will begin as soon as weather conditions permit. Additional chalets will be built as rapidly as the demand for this class of service requires and the northern part of the park becomes accessible. Transportation facilities provided for in the new concessions promise results of corresponding importance. It is contemplated that the Desmond Commissary Company will take over the concessions now operated between El Portal and the Yosemite Valley by arrangement with the present concessioner and will operate a motor service. This concessioner will also operate a motor service between Crocker and the Valley over the Big Oak Flat Road recently turned over to the Government, and another over the Tioga Road. A. B. Davis will continue his auto stage line between El Portal and the Valley by way of the Tuolumne Grove of Big Trees, and the Yosemite Stage and Turnpike Company will continue its line between the Valley and Wawona and the Mariposa Grove. All these undertakings will be under strict Government supervision as regards rates. One of the Department's most cherished objects is to make the Yosemite available for the use and enjoyment of people of moderate income, and the rates will be kept as low as it consistent with good service and a reasonable return on the investments of the various concessioners.

The Appalachian Park Association

By GEORGE S. POWELL, *Secretary*

THE mission of the Appalachian Park Association is to make known more generally the advantages and attractions of the Southern Appalachian Mountains as a pleasure and recreation resort, to cooperate with the National Government in protecting and conserving the forests and streams of these mountains, and aid in developing and encouraging the tourist business.

We now have an opportunity to greatly further this work by showing the people of the South the importance of getting prompt and favorable action from Congress upon the recommendation of the National Forest Reservation Commission, for a further appropriation, providing for continued purchases of lands under the Weeks law, until 1920, at the current rate of \$2,000,000 a year.

The general condition of the National Forests of the South at this time as to areas and contiguousness, is not such as to warrant the hope for much practical development along the lines of pleasure and recreation, until these conditions are bettered by additional purchases, making larger contiguous areas, and thereby affording opportunity for development along broader and more economical lines.

Good roads must, of necessity, be a prime factor in promoting the tourist business in these mountains, and while the expectation of good road construction has aided in securing public endorsement of our purposes, we realize that anything like a connecting system of roads through the National Forests at this time, is not feasible. We should, therefore, direct our efforts for the present, to additional purchases, and making better known the attractions of this region in climate, scenery, water, fishing, hunting, trails, etc.

Secretary Lane, of the Interior Department, estimates that \$100,000,000, which, under ordinary circumstances would be spent by American tourists in Europe, this year will be held in the United States. When we take into consideration the magnitude of the tourist business, the large profits derived from it, and the opportunity made by the war in Europe for the United States to secure for at least many years a large part of this business that has heretofore gone abroad, we can understand why our people are urging greater use of the National Parks and Forests for pleasure purposes.

If the Southern Appalachian Mountains were made as accessible by good roads, as the mountains of Switzerland, or even as some of the National Parks of the West, the tourist business would bring more clear profit to the six States bordering on those mountains, namely: Virginia, Tennessee, Alabama, Georgia, South Carolina and North Carolina, than probably any crops produced in these States, excepting cotton and corn.

With these opportunities for developing so profitable a business at a small cost, it is hoped the newspapers and business organizations of the South will begin an active campaign to secure from Congress favorable action upon the recommendation of the Commission, so that purchases under the Weeks law, may be completed and a comprehensive plan of development begun providing for greater use of these forests for pleasure and recreation.

WORK NOW AGAINST GIPSY AND BROWN-TAIL MOTHS

IN THE areas infested by the gipsy moth or the brown-tail moth, much effective work can be done in the fall to reduce the damage that these insects are likely to cause the following year, according to entomologists of the United States Department of Agriculture. The which remains on the tips of the twigs and branches during the winter. These webs should be cut and burned so that injury will not be caused by the caterpillars the following summer. Particular attention should be given to webs of this insect on trees which grow around dwellings or in orchards.

The apple, pear, cherry, oak and willow are among the plants which are favored as food by the brown-tail moth caterpillars. In order to minimize the damage which is likely to result, as much time as possible should be devoted to cutting and burning worthless or seedling apple trees and wild cherry trees and brush. If this is done along the roadways and fences, the appearance of the region will be greatly improved. Care should be taken to protect pine and other coniferous trees, and hickory and ash should not be cut, as they are not favored for food either by the caterpillars of the gipsy moth or by those of the brown-tail moth. The oak is a favored food of the brown-tail moth and of the gipsy moth, and wherever it is possible to eliminate oaks less annoyance from these pests will be experienced.

FEW FOREST FIRES

DURING the present year there have been but 14 forest fires on the Black Hills National Forest. The total area burned over is about 13½ acres. Both records have never before been equaled in this region. The absence of fires is of course primarily due to the excess of moisture and it may indeed be a surprise to think that conditions have at any time been such as to even make a forest fire possible.

Although weather conditions have been very favorable the vigilance of the Forest Officers is not permitted to lag, for danger is ever present and is not finally removed until there is a good mantle of snow throughout the Hills.

Forest Notes

Georgia State Forest School

A bulletin of the Georgia State College of Agriculture gives considerable space to the forest school department which is making such excellent progress under the direction of Prof. James B. Berry. A four-year course is given in technical forestry and allied subjects to those who desire forestry as a profession, short practical courses for those students in agriculture who desire general knowledge as to the management of small tracts of timberland, direct assistance to residents of the state in the management of forest property, and general research along the line of problems now confronting the state.

In the four-year professional course, opportunity is given to specialize in certain main lines and provision is made for six hours of elective work throughout the Junior and Senior years. For those students desiring to specialize in City Forestry an opportunity is offered for the election of Landscape Gardening and allied subjects; for those desiring to specialize in technical forestry, with the object of entering the federal or state service, the election of advanced courses in Botany and Forestry; for those desiring to specialize in Lumber Salesmanship and Mill Superintendency, the election of courses in Economics and Business Administration; for those desiring to specialize in Dendropathology, the election of advanced courses in Botany.

North Carolina's Meeting

The North Carolina Forestry Association will hold its sixth annual forestry convention in Newbern, North Carolina, on Tuesday and Wednesday, January 18 and 19, 1916. This is the first time the Association has been called to meet in the eastern part of the state, and it is expected that this departure will be amply justified by the increased attendance. The Coastal Plain region of the state is the seat of the North Carolina pine industry and is the greatest lumbering region northeast of Louisiana. A large lumbering concern has kindly tendered the convention an excursion over one of its operations. This trip will be arranged for the second day of the meeting. In this way the delegates will have an unequalled opportunity of learning of some of North Carolina's most pressing forestry problems at first hand.

Forester Appointed

Henry B. Steer, a graduate in forestry, class of 1914, has just received an appointment for forest work in the Indian Office, United States Department of the Interior. He will work on the eastern Cherokee lands in western North Carolina. Where for-

ested areas exist in connection with Indian reservations, it is the aim of the Indian Service to give these resources their fullest possible use by harvesting the timber under proper forest management. The Indian office has a regular corps of foresters and resident forest officers on most of the reservations where timber is growing.

Short Forestry Course

Prof. Hugo Winkenwerder, Dean of the Department of Forestry at the University of Washington, Seattle, announces that a short course in forestry and lumbering is to be given at the University this winter from January 3 to March 28. These short courses are offered for the benefit of persons engaged in some phase of the timber industry and who desire to increase their efficiency, but who cannot take the time required for a broader course. In outlining the courses a special effort has been made to have them simple, concise and thoroughly practical. The work is given by means of lectures, quizzes, laboratory and field practice. Although the time is only of twelve weeks' duration, the location of the University and equipment makes it possible to do thorough work in the subjects given. A high school training is not necessary for entrance, but students should be at least 20 years old. Three distinct courses are offered: Forestry, Logging, and Lumber and Its Uses.

Lecture Course on Lumber

The University of Wisconsin, through its Extension Division, will shortly begin an evening lecture course on Lumber and Its Uses, in order to give the makers or users of wood a greater knowledge of the structure of the material with which they deal. The plan has won the instant approval of the Lumber Dealers' Association, the Milwaukee Chapter of the American Institute of Architects, and the Mill Workers' Association, and a number of their members, nearly all of them heads of firms, will attend the classes. The work, however, is not intended only for builders and manufacturers, but is adapted to meet the needs of draftsmen, painters, furniture and cabinet makers, and men of other industries which deal in wood.

Books on Forestry

The Extension Service of the New York State College of Forestry is arranging a number of sets of books on Forestry and related subjects, to be used as small circulating libraries throughout the State. The list will include a number of important State and National bulletins as well as

some fifteen standard books. The Extension Service hopes to have these circulated widely among study clubs, schools and debating teams in the State.

Directory of Wood Users

The Department of Wood Utilization in the New York State College of Forestry is maintaining an ever-increasing directory of active users and producers of forest products throughout the State of New York. A series of Wood Utilization service bulletins are published each month containing a list of the needs or offerings of the Department's correspondents. It is encouraging to know that the Service has been of tangible value and that a large number of profitable sales have been brought about through it. In a number of instances manufacturers who have thrown away a certain class of waste heretofore have been brought into direct contact with some concern which could utilize just this sort of waste material.

Trees Dynamited to Stop Fires

Out in the forest near Mount Baldy, Los Angeles, California, a fierce forest fire was raging recently. After it had blazed for several days it was brought under control. The next day a fresh wind started the fire again and it threatened destruction to the entire forest. After all other methods had been tried, dynamite was secured. Hundreds of trees were dynamited to make the fire break, and it was soon put out. The dynamiting was in charge of Ranger Fritz, of Camp Baldy Station, and three forest patrols.

Berks County Work

During the past six years it was noticed that the water supply was failing in Berks County, Pa., and the chestnut trees were dying, owing to the blight. The cause of the failing water supply was not so easily explained. An investigation proved it was due to careless lumbering and frequent forest fires which had ruined the forest floor almost over the entire county. Lack of water power had closed up grist mill after mill until barely a half dozen out of hundreds that were once operated were now able to drive their wheels even for two days in succession.

What to do to remedy this matter was a question. Daily during the summer months the press was filled with items about wells going dry on the farms. Next Burgesses curtailed the use of water in the towns, stating that the supply was low. This condition inspired S. L. Parkes to form the Berks County Conservation Association, and this was done a year ago.

The organization immediately became active and during the year, the work ac-

complished by it has thoroughly aroused the community to the needs of such a body.

The first thing that was undertaken was the reforestation of bare and unsightly spots on the Reading Mountains by planting 3,000 seedling pines. A paid forest fire patrol of fourteen men was placed on duty, as well as a mounted patrol of six men composed of two details of State police. Fire wardens were appointed by the State Commissioner of Forestry. Two model forestry stations were established at two orphans' homes in the county, where the trees were planted and cared for by the orphans under the supervision of Mr. Parkes. Seven thousand seedling pines were planted by 125 members of the 1916 class of the Boys' High School, on Mt. Penn, Reading, and the following day Mr. Parkes took 431 pupils of the Girls' High School out on the Antietam watershed, where they planted 8,000 seedlings.

Several boroughs were also interested in planting trees on their watersheds, this planting being done by school children. One idea that Mr. Parkes is proving is that school children as well as individual woodlot owners should be interested in reforestation. The city of Reading, at the suggestion of Mr. Parkes, was induced to start a municipal nursery. Fifteen thousand seedlings are growing nicely. Over 50,000 seedlings have been planted in the county so far.

New York's Steel Look-out Tower

According to the report of District Forest Ranger Todd made to the Conservation Commission at Albany, an all steel mountain observation station in the forest fire service has just been completed. The tower is on Balsam Lake mountain in Ulster county, is forty feet high, and was constructed at a cost of \$135. Twenty-five dollars of this amount was donated by George J. Gould of New York City, who owns considerable forest land within the range of the station. The erection was done almost entirely by the forest rangers. The value of steel towers on mountain stations has long been appreciated by the commission and as soon as the necessary money is available, steel towers will be substituted for the unsteady wooden structures now in use.

Alaska Forests Reserved

Upon the recommendation of the Secretary of the Interior and of the chairman of the Alaskan Engineering Commission, the President, in accordance with the Alaskan railway act, has signed an order establishing an extensive timber reserve, approximately 200 miles in length and from 5 to 10 miles in width, in that territory, to be known as "Alaskan timber reserve No. 1."

The reserved timber is on the public lands north of the Chugach National Forest. The purpose of the reservation is to prevent the timber needed for the construction of the Government railroad and its branches in Alaska from falling into the possession of individuals or corporations, in which event it would be necessary for the Government to purchase timber which it once owned. It is not the intention of the Government, however, to make any unnecessary restrictions which will tend to retard the development of the territory of Alaska along the line of the railroad or its branches, and in the withdrawal order the interests of the public have been conserved. Only the timber on the land, not the land itself, has been reserved.

Report on Street Trees of New York City

Prof. Laurie D. Cox, Landscape Engineer of the College of Forestry at Syracuse, has just completed a report made as a result of three months study of street tree conditions in New York City. This study was made upon invitation of Hon. Cabot Ward of the Park Department of New York City and was carried out with the funds given by John D. Rockefeller, Jr. New York City has made no systematic effort to plant its streets with trees and the report of Professor Cox will outline a practical system of street tree planting, based not only upon the studies of the past summer but upon careful investigation of street tree work in such cities as Buffalo, Rochester, Newark, New Haven and Boston.

Pitch Moth Damages Douglas Fir

Nine-tenths of the defects in Douglas fir timber, which are locally known as pitch seams, gum check, windshake, etc., are due to the work of the Douglas fir pitch moth, according to a recent investigation conducted by entomologists of the United States Department of Agriculture. This moth, it is estimated, causes a loss in the total output of Douglas fir of from 7½ to 15 per cent, and in one mill, where the loss was lower than the average it amounted in money to \$18,900 for that season's cut alone. This money, says Bulletin No. 255, which the department has just published on this subject, would be sufficient to keep the area on which the timber was cut clean from the moth for a period of 15 years.

The only way in which an infestation of the pitch moth can be reduced is to destroy the larvae, the presence of which is always made known by the protruding pitch tube. When this tube is located, it should be separated from the tree and the larvae thus exposed killed. The wound may then be smoothed with a knife or small ax, and painted with creosote to prevent reinfestation by insects or fungi.

Forests and Farmers

The national forests, says an article in the Year Book of the Department of Agriculture, just issued, besides being the American farmer's most valuable source of wood which is the chief building material for rural purposes, are also his most valuable source of water, both for irrigation and domestic use. In the West, they afford him a protected grazing range for his stock; they are the best insurance against flood damage to his fields, his buildings, his bridges, his roads, and the fertility of his soil. The national forests cover the higher portions of the Rocky Mountain ranges, the Cascades, the Pacific Coast ranges, and a large part of the forested coast and islands of Alaska; some of the hilly regions in Montana and in the Dakotas, Oklahoma, and Arkansas, and limited areas in Minnesota, Michigan, Florida and Porto Rico. In addition, land is now being purchased for national forests in the White Mountains of New England and in the southern Appalachians. In regions so widely scattered, agricultural and forest conditions must necessarily differ to a great degree, bringing about corresponding differences in the effect of the national forests on the agricultural interests of the various localities. Wherever agriculture can be practiced, however, the farmer is directly benefited by the existence of national forests and by their proper management.

Wood Pulp in Argentina

As the result of experiments carried out by a Swedish paper expert, it has been ascertained that Argentina produces a tree in abundance which provides excellent raw material, better even in quality than that usually employed in making paper pulp in both Europe and the United States. This tree is the *Araucaria imbricata*, a picture of which may be seen in AMERICAN FORESTRY for August, page 850.

With a view to confirming independently the report of the Swedish expert, the Minister of Agriculture commissioned two Government engineers to investigate and report upon the properties of the *Araucaria imbricata*. These gentlemen recently presented their report, from which it appears that in the Territory of Neuquen this tree is found over an area of more than 1,000,000 hectares (2,470,000 acres). Three and one-half average trees suffice to produce one ton of pulp. Where news print paper is concerned, two and one-half trees will provide one ton of pulp.

Philippine Lumber for China

The Director of the Philippine Bureau of Forestry, who has recently returned from a trip to China in the interests of Philippine lumber, reports that there is a market in China for all the lumber produced in the islands if the proper connec-

tions can be made between the producer and consumer. The Chinese dealers want a guarantee of a constant supply. They are not willing to accept one consignment, but demand that they be assured of continuous supply, even though it be small. An American formerly in the service of the Philippine Government, now in business in Shanghai, reports that there is a demand there for Philippine lumber, but there is not a constant supply, and the purchaser is never sure of getting enough of the same class to complete his particular job.

Book Reviews

The Zimmerman Pine Moth, By Josef Brunner. U. S. Dept. Agri. Bull. 295. 12 pp. XI pls. Washington, D. C., Oct. 28, 1915.

For years this insect was known as an enemy of pine in the east. More recently it was found by the forest entomologists to be a rather serious enemy of second-growth pine, especially yellow pine, also in the west. While of secondary importance economically, it is largely a primary insect physiologically as regards the trees it attacks. From the standpoint of pure science the life history of any insect is capable of yielding facts that may shed light on hitherto obscure points in one or more phases of general biology. From the economic standpoint we have had repeated occasion to be impressed with the importance of knowing everything possible about the seasonal and life history of all insects having an economic bearing, however small this rôle may be, as the only means of discovering available opportunities for combating them if they are injurious or utilizing their services if they are beneficial. The paper before us is another illustration pointing to the emphasis to be laid on as nearly complete a knowledge as possible of the habits of an injurious insect. The Zimmerman pine moth, the author demonstrates, is most injurious to second growth on which we would apparently be utterly helpless in combating it under forest conditions where the use of insecticides is out of the question. But his careful two-year study of the insect showed that it inhabits dominantly also some old lightning-struck or gnarly branched trees left standing in the midst of old clearings. These trees serve the moth largely as "brood trees," as the author calls them, and thus to stock the area with it. It becomes perfectly patent, therefore, that the removal of such brood trees should practically eliminate the insect as a serious pest. The actual experiment cited shows this conclusion to be operative in practice, and the recommendation is made accordingly.—J. K.

They Like American Forestry

"I have just had an opportunity to look over the numbers of AMERICAN FORESTRY which have been issued during my absence in Alaska. I write this to tell you how delighted I am with the new form of AMERICAN FORESTRY, and to offer you my congratulations. The new magazine is exceedingly attractive, far more so than the old form; it is dignified, and offers a far better opportunity than previously to reach the reading public. Every member of the Association should be proud of the magazine, and there is due to you great commendation and credit for the way you are handling it."

HENRY S. GRAVES, *Chief Forester,*
Washington, D. C.

"May I heartily congratulate you on the magazine's new dress. It is most motish and intensely interesting and a joy to the eye."

STANLEY CLISBY ARTHUR,
Ornithologist,
New Orleans, La.

"Congratulations upon the new form of publication. Fine!" JOHN T. HARRIS,
Washington, D. C.

"I certainly wish to congratulate you on the excellent new form and appearance of AMERICAN FORESTRY." E. G. GRIGGS,
Tacoma, Washington.

"The enlarged edition of AMERICAN FORESTRY to hand. Allow me to congratulate you on the new issue. I sincerely trust it may increase in circulation and recompense you for your efforts to place before the public such instructive and excellent literature. Wishing you every success, I am"

SISTER MARY ALOYSIUS, *Directress,*
Convent of Mercy, Plymouth, Pa.

"I cannot refrain from expressing my admiration for AMERICAN FORESTRY in its new form—the magazine is a gem—and I have no doubt that the great educational work in which you are engaged, and which has already accomplished so much, will receive a greater stimulus from now on."

WILLARD FRACKER,
Washington, D. C.

"Congratulations on the new form of AMERICAN FORESTRY. This new number is mighty fine and I am sure will not only please the present subscribers but will mean large additions to your subscription list. As my brother, Ray Stannard Baker, has had a good deal to do with the making of the *American Magazine*, I have followed with a great deal of interest the development of some of the magazines of this country. Your change is in line with the changes which the *American Magazine* made earlier and which *McClure's*, *Hearst's* and others have made more recently. With lots of good wishes for the new magazine as it really is,—"

HUGH P. BAKER,
Dean, New York State College of Forestry, Syracuse, N. Y.

"Kindly allow me to congratulate you on the August issue of AMERICAN FORESTRY. It is a credit to you and to your associates, and I hope that the time will come when you can boast of a much larger circulation. You are particularly fortunate in being able to start a Wood Preserving Department and more especially in being able to have Mr. Sterling handle it."

C. M. TAYLOR,
Superintendent, Port Reading Crecosoting Plant, Port Reading, N. J.

"I was very much interested in the August number of the AMERICAN FORESTRY, and congratulate you upon the excellent article that you have prepared on the Yellow Poplar Tree."

W. H. WELLER,
Secretary, Hardwood Mfrs. Assn. of the U. S., Cincinnati, Ohio.

"Have received AMERICAN FORESTRY for August, containing the article relative to 'How Switzerland Cultivates Her Forests,' and take this opportunity of complimenting you upon the splendid manner in which you have published this contribution."

M. DOSSENBACH,
New York City.

"I am sure you are getting a great many letters of congratulation upon the fine appearance and excellent quality of the August number of AMERICAN FORESTRY. I hope there are many applications for membership in the Association coming also. Permit me to add my little word of praise and appreciation, and to say that I have noted the steady improvement in AMERICAN FORESTRY for many months, but look upon the new departure as a kangaroo leap forward for conservation."

W. R. FISHER,
Secretary, Pocono Protective Fire Association, Swiftwater, Pa.

"We are just in receipt of the August issue of AMERICAN FORESTRY and would tender you our congratulations on the improved size, form and make-up."

H. A. GATCHEL,
Philadelphia, Pa.

"Glad to see the change in the August issue. It is fine, and most interesting throughout."

S. C. CROMELIN,
Berkeley Springs, W. Va.

"The cover on the August number, which just made its appearance, is simply great."

PROF. J. S. ILLICK,
State Forest Academy, Mont Alto, Pa.

"The August issue is just at hand. There should be increased interest in the magazine now that you are able to give better illustrations. The Department idea is good."

PROF. RALPH S. HOSMER,
Forestry Department, N. Y. State College of Agriculture at Cornell University, Ithaca, N. Y.

"The publication seems to me admirable and many of the articles are of great value."

HON. R. GRIGG,
Commissioner of Commerce, Ottawa, Canada.

Canadian Department

ELLWOOD WILSON
Secretary Canadian Society Forest Engineers

The Canadian Forestry Association has just moved into new and commodious quarters in the Booth Building, Ottawa, and will now have every facility for carrying on the excellent campaign for the proper use of our timber resources so well started by the Secretary, Mr. Robson Black.

Mr. Black's investigation of the "fake settler" question in Quebec has aroused general interest and will do a great deal to finally stop this abuse and hold up the hands of the Minister of Lands and Forests, Mr. Allard, who has found this one of the difficult questions of his administration and has done his best to stop it.

Mr. R. R. Bradley, Forester for the New Brunswick Railway Company, will establish a forest nursery in the spring and commence the reforestation of lands owned by that Company.

A very interesting forest is to be seen at Oka, Quebec, where is situated the Trappist Monastery which is famed for its cheese. Twenty-six years ago the drifting sands of that neighborhood commenced to threaten the village, Father Lefebvre engaged children and Indians to go to the woods and bring out pine seedlings for which he paid two to five sous. Sixty-five thousand were planted out and of these it is estimated not more than five thousand died. Today the trees in this forest are twenty-five to thirty feet high. The sands were checked and a great asset given to this section. This forest is an added attraction to anyone visiting the monastery and reflects great credit on the grave priest who had imagination enough to look into the future.

A forest expert after a trip through a certain section of northern Canada estimates the loss of timber from forest fires in the last thirty years at 16,000,000,000 feet which at fifty cents per thousand would mean a loss of eight million dollars.

Mr. Albert Grigg, M. P. for Algoma, has been appointed Deputy Minister of Lands and Forests for Ontario, to succeed the late Aubrey White. Mr. Grigg was born in Ontario in 1873 and was Mayor of Bruce Mines and a pioneer of the Algoma District where he held many positions of public trust. He was first elected to the Ontario Legislature in 1908 and again in 1911 and 1914 and is a forceful and interesting speaker and is regarded as one of the most promising members of his party. He is progressive in spirit and is well acquainted with the conditions in the forest

districts of his Province. Wake up, Ontario.

Mr. J. R. Booth, the pioneer lumberman of Ottawa, has caused to be piled ready for burning at a safe time, inflammable debris on a narrow strip of his limits parallel to a portion of the Canadian Northern Railroad east of North Bay. This is a progressive step and it is hoped that it will soon be followed by other limit holders.

The last issue of *Conservation*, the organ of the Commission of Conservation of the Dominion Government, makes the statement that during the construction of the Hudson Bay Railway five hundred thousand acres of timberland have been burnt due to defective equipment used by the contractors and to carelessness on their part. This is the history of all railway construction in Canada, but with this difference: During the construction of the National Transcontinental through Quebec a part of the line was patrolled by the limit holders in cooperation with the contractors and with the Department of Railways and Canals and the Quebec government, and very little was burnt on this section and an example set for future work. This work was called to the attention of the Hon. Minister of Railways and Canals. It is little short of criminal for such a thing to happen; to have it happen through the fault of a private corporation is bad enough, but to have it happen on work under the authority and supervision of a Government Department is still worse. What can be said to private corporations and persons about preventing forest fires when the Dominion Government itself is guilty of such negligence as this? Why attempt to protect the Government lands from fire, why prosecute a few settlers, when a Government Department burns up Government lands itself? Have any body of men, chosen to care for the people's interests, the right to be so negligent, so careless, and so entirely without regard for the property of the public. It is high time that the ever-patient public speak with no uncertain voice and put a stop to such negligence.

Messrs. B. Guerin, Geo. H. Boisvert, and Ernest Menard, graduates of the Laval Forestry School and now of the Quebec Forest Service, have been elected to active membership in the Canadian Society of Forest Engineers. These gentlemen have done much in the way of exploration work in the northern part of the Province and have made some very interesting reports

and studies. They all hold the rank of District Inspector.

On September 29 a get-together meeting of the Coast Rangers of the Dominion Forest Service was held at New Westminster, B. C., and men from all parts of the Dominion were present. The consensus of opinion of the meeting was that the burden of proof should rest on the man who owned the land on which a fire started to prove that it was not set by him. The meeting was a very enjoyable one and much valuable information was brought out and exchanged.

British Columbia Notes

According to the timber returns for the month of September issued by the Minister of Lands, the total output of sawlogs for the Province, as shown by the scaling figures, amounted to 92,080,493 feet board measure, while 361,911 lineal feet of poles, piles, and props, together with 29,312 cords of railway ties, fence posts, shingle bolts, etc., were also scaled for royalty during the month under review. The figures for the Vancouver district were 53,001,924 feet board measure sawlogs, 14,394 lineal feet piles, etc., and 16,264 cords, ties, bolts, etc., the Island district contributing 5,307,218 feet sawlogs, in addition to 2,520 lineal feet piles. In the Prince Rupert district there were scaled 954,135 feet sawlogs, while the totals under the same heading for the Cranbrook, Nelson and Vernon districts were respectively 21,593,575 feet, 7,135,290 feet, and 3,349,603 feet. Poles, piles and props to the total of 328,304 lineal feet were scaled in the Nelson district, and in the Cranbrook division to the total of 15,013 lineal feet.

Timber sales recorded during September cover an estimated total of 7,338,000 feet sawlogs, and 3,030 cords of shingle bolts, estimated to produce a total revenue of \$12,876.

The Hon. W. R. Ross is advised by the Department of Trade and Commerce at Ottawa, that the exhibits of British Columbia lumber recently sent to Australia are being shown at the Royal Exchange, Sydney, and will afterwards be featured at an approaching architectural exhibition. The Canadian Trade Commissioner at Melbourne, to whom the exhibits were consigned, is arranging for timber importers, builders, and others who are interested to view them, and reports that the varied and beautiful finish which British Columbia Douglas fir takes has been the subject of considerable comment. It will be remembered that a number of these exhibits were sent abroad earlier in the year, and, as in the case of the Sydney display, have attracted much attention in the important trade centers at which they have been placed.

Current Literature

MONTHLY LIST FOR NOVEMBER, 1915

(Books and periodicals indexed in the library of the United States Forest Service.)

FORESTRY AS A WHOLE

Proceedings and reports of associations, forest officers, etc.

Hongkong—Botanical and forestry department. Report for the year 1914. 36 p. Hongkong, China, 1914.

India—Burma—Forest department. Report on the forest administration in Burma for the year 1913-14. 123 p. Rangoon, 1915.

Queensland—Department of public lands. Annual report of the director of forests for the year 1915. 7 p. pl. Brisbane, 1915.

Forest Education

Arbor day

New Hampshire—Forestry commission. An arbor day message to the rural schools of New Hampshire. 4 p. Concord, N. H., 1915. (Circular 6.)

Exhibitions

Japan—Department of agriculture—Bureau of forestry. Descriptive catalogue of Japanese wood specimens exhibited at the Panama-Pacific international exposition, San Francisco, U. S. A. 27 p. il. Tokyo, 1915.

Forest Description

Maryland—State board of forestry. The forests of Anne Arundel County, by F. W. Besley. 28 p. pl., maps. Baltimore, Md., 1915.

Forest Botany

Fletcher, W. F. The native persimmon. 28 p. il. Wash., D. C., 1915. (U. S.—Dept. of agriculture. Farmers' bulletin 685.)

House, Homer D. Woody plants of Western North Carolina. 34 p. Darmstadt, Germany, C. F. Wintersche buchdruckerei, 1913.

Maiden, Joseph H. A critical revision of the genus *Eucalyptus*, pt. 23. 17 p. pl. Sydney, N. S. W., 1915.

Silvics

Frothingham, Earl H. The northern hardwood forest; its composition, growth and management. 80 p. pl. Wash., D. C., 1915. (U. S.—Dept. of agriculture. Bulletin 285.)

Forest Mensuration

Troup, R. S. The compilation of girth increment from sample plot measurements. 9 p. Calcutta, 1915. (India—Forest dept. Forest bulletin no. 30.)

Silviculture

Planting and nursery practice

Rafn, Johannes. The testing of forest seeds during 25 years, 1887-1912. 91 p. il., front. Copenhagen, 1915.

Forest Protection

Insects

Brunner, Josef. The Zimmerman pine moth. 12 p. pl. Wash., D. C., 1915. (U. S.—Dept. of agriculture. Bulletin 295.)

Taylor, A. R. Spraying for the control of the walnut aphid. 11 p. il. Berkeley, Cal., 1915. (California—Agricultural experiment station. Circular no. 131.)

Diseases

Horne, William Titus. Wood decay in orchard trees. 13 p. il. Berkeley, Cal., 1915. (California—Agricultural experiment station. Circular 137.)

Fire

Holmes, J. S. Forest fires in North Carolina during 1914, and forestry laws of North Carolina. 55 p. 26 cm. Raleigh, N. C., 1915. (North Carolina—Geological and economic survey. Economic paper no. 40.)

Holmes, J. S. Organization of cooperative forest fire protective areas in North Carolina. 39 p. Raleigh, N. C., 1915. (North Carolina—Geological and economic survey. Economic paper No. 42.)

New Hampshire—Forestry commission. Equipment for fighting forest fires; save damage and expense by being prepared. 12 p. il. Concord, N. H., 1915. (Circular 5.)

Northern forest protective association. Review of the work for the year ending March 2, 1915, together with the proceedings of the 4th annual meeting. 48 p. il. Munising, Mich., 1915.

West Virginia—Dept. of forestry, game and fish. A handbook of forest protection; forest laws; instructions to fire fighters; lookout stations and equipment; list of deputy forest, game and fish wardens. 40 p. Belington, W. Va., 1914.

Forest Legislation

Michigan—Laws, statutes, etc. A synopsis of the game and fish laws of Michigan for 1915-1916. 20 p. Munising, Mich., Northern forest protective association, 1915.

United States—Dept. of agriculture—Forest service. State forestry laws: Oregon. through regular session, 1915. 7 p. Wash., D. C., 1915.

West Virginia—Laws, statutes, etc. West Virginia forest, fish and game laws, and federal laws. 2d ed. 70 p. Belington, 1915.

Forest Administration

United States—Dept. of agriculture—Forest service. October field program, 1915. 31 p. Wash., D. C., 1915.

Forest Utilization

Lumber industry

Elliott, Perry, comp. Our foreign trade in farm and forest products. 51 p. Wash., D. C., 1915. (U. S.—Dept. of agriculture. Bulletin 296.)

Smith, Franklin H. China and Indo-China markets for American lumber. 39 p. Wash., D. C., 1915. (U. S.—Department of commerce—Bureau of foreign and domestic commerce. Special agents series no. 104.)

United States—Dept. of commerce—Bureau of foreign and domestic commerce. Directory of American sawmills, compiled at the Department of agriculture, Forest service, by J. C. Nellis and A. H. Pierson. 260 p. Wash., D. C., 1915. (Miscellaneous series no. 27.)

United States—Federal trade commission. Conference with National lumber manufacturers association, Chicago, July 19-20, 1915. 199 p. Chicago, Ill., National lumber manufacturers' association, 1913.

United States—Federal trade commission. Hearing before the Federal trade commission by redwood, sugar pine and white pine manufacturers of California 57 p. San Francisco, Cal., California redwood association, 1915.

Wood-using industries

Surface, Henry E. Feasibility of manufacturing paper pulp from Tasmanian timbers. 11 p. Hobart, Tasmania, 1915.

Wood Technology

Benskin, E. Note on blackwood, *Dalbergia latifolia*. 12 p. pl. Calcutta, 1915. (India—Forest department. Forest bulletin no. 27.)

Benskin, E. Note on dhauri, *Lagerstroemia parviflora*. 11 p. pl. Calcutta, 1915. (India—Forest dept. Forest bulletin no. 28.)

Pearson, R. S. Note on sundri timber, *Heritiera minor*. 8 p. pl. Calcutta, 1915. (India—Forest dept. Forest bulletin no. 29.)

Warren, W. H. Timber physics: treatise on timber tests and summary of results. 28 p. il., diagrs. Sydney, N. S. W., 1915. (New South Wales—Dept. of forestry. Bulletin no. 10.)

Auxiliary Subjects

Conservation of Natural Resources

Canada—Commission of conservation. Report of the 6th annual meeting, held at Ottawa, Jan. 19-20, 1915. 333 p. pl., maps. Ottawa, 1915.

New York—Constitutional convention—Committee on conservation of natural resources. Report relative to several proposed amendments. 20 p. Albany, N. Y., 1915.

National parks

United States—Dept. of the interior. The Mount Rainier national park, season of 1915: general information. 38 p. Wash., D. C., 1915.

Periodical Articles

Miscellaneous periodicals

- Botanical gazette, Sept. 1915.—Is the box elder a maple? A study of the comparative anatomy of *Negundo*, by Amon B. Plowman, p. 169-92.
- Botanical gazette, October, 1915.—Vascular anatomy of the megasporophylls of conifers, by Hannah C. Aase, p. 277-313; The index of foliar transpiring power as an indicator of permanent wilting in plants, by A. L. Bakke, p. 314-19.
- Bulletin of the Torrey botanical club, Aug. 1915.—A study of pasture trees and shrubbery, by Ernest L. Scott, p. 451-61.
- Cornell rural school leaflet, Sept., 1915.—Forestry in the rural schools, by Frank B. Moody, p. 245-8; The oaks of New York, by John Bentley, Jr., p. 248-54; The pines of New York, by John Bentley, Jr., p. 255-8; Trees to be recognized in 1915-1916, by Frank B. Moody, p. 258-63.
- Country gentleman, Oct. 23, 1915.—Blighted chestnut and a bank balance; timber profit from a farm woodland, by Helen Christine Bennett, p. 1608-9; Coyote madness; how action is being taken to prevent the spread of rabies, by Randall R. Howard, p. 1624.
- Country gentleman, Oct. 30, 1915.—Pine-stump profits, by J. R. Crowe, p. 1663-4.
- Country life in America, Oct., 1915.—The common woods as used in building, by W. H. Butterfield, p. 38-9.
- Garden magazine, Nov. 1915.—The glory of the autumn, by E. H. Wilson, p. 109-11.
- Gardeners' chronicle, Oct. 2, 1915.—Forming new plantations, by A. D. Webster, p. 211.
- Gardeners' chronicle, Oct. 9, 1915.—*Larix pendula*, by A. Henry, p. 234.
- In the open, Sept., 1915.—A talk on forest fires, their fearful cost and the ease of preventing them, by George H. Wirt, p. 55-7.
- International institute of agriculture. Monthly bulletin of agricultural intelligence and plant diseases, June, 1915.—Forestry in the United States at the present day, by Jas. W. Toumey, p. 779-85.
- International institute of agriculture. Monthly bulletin of economic and social intelligence, Sept., 1915.—Forest school mutual societies, p. 45-7.
- International institute of agriculture. Monthly bulletin of economic and social intelligence, Oct., 1915.—Technical conditions of forestry insurance, p. 41-52; The valuation of the timber resources of the forests in the province of Värmland, by Henrik Hesselman, p. 111-15.
- Irish gardening, June, 1915.—*Pinus pinaster* for sowing on peat bogs in Ireland, by A. MacGregor, p. 86-7.
- Journal of the Board of agriculture, London, May, 1915.—Wood waste from saw mills as a source of potash, by C. T. Gimingham, p. 146-8.

- Journal of heredity, Nov., 1915.—How the bark breathes, p. 490-3; An unusual persimmon tree, p. 525; The tree that owns itself, by T. H. McHatton, p. 526.
- National wool grower, Oct., 1915.—Deferred and rotation grazing, Hayden forest, Wyo., by L. H. Douglas, p. 11-14; Grazing inspector visits Portland, by Will C. Barnes, p. 16.
- Overland monthly, Aug., 1915.—Taking a timber claim, by M. E. McGuire, p. 147-56.
- Reclamation record, Nov., 1915.—Tree planting: Klamath project, Oregon-California, p. 514.
- Rhodora, Sept., 1915.—The hemlock spruce, by O. A. Farwell, p. 164.
- Special libraries, Sept., 1915.—Forestry and lumbering in the northwest from the librarian's viewpoint, by Mrs. Georgene L. Miller, p. 109-12.
- United States—Department of agriculture. Weekly news letter, Nov. 10, 1915.—How the farmer can use the facilities of the Department of agriculture: Forest service, p. 6.

Trade journals and consular reports

- American lumberman, Oct. 9, 1915.—Lumber tractors, by Archie Chandler, p. 41.
- American lumberman, Oct. 23, 1915.—Advises as to lumber needs of United Kingdom, by H. R. MacMillan, p. 35; Proper laying of wood blocks must be taught, p. 52.
- American lumberman, Oct. 30, 1915.—Does the lumber industry need radical reorganization? by E. B. Hazen, p. 30-50.
- American lumberman, Nov. 6, 1915.—Forest products featured: Forest service makes unique exhibit at the Portland, Oregon, show, p. 29; Wooden water pipe supplants worthless iron, p. 33.
- Canada lumberman, Oct. 15, 1915.—British Columbia red cedar, by Aird Flavell, p. 30-2.
- Engineering news, July 29, 1915.—Log-handling equipment at Arrowrock dam, by Charles H. Paul, p. 200-1.
- Engineering news, Aug. 26, 1915.—Report on life of wood pipe, by D. C. Henny, p. 400-3.
- Engineering record, Sept. 11, 1915.—Longleaf pine distinguished visually from loblolly or short leaf, by Arthur Koehler, p. 319-20.
- Hardwood record, Oct. 25, 1915.—Facts and frauds of witch hazel, p. 23.
- Hardwood record, Nov. 10, 1915.—Conditions in case-hardened wood, by James E. Imrie, p. 24-6.
- Journal of industrial and engineering chemistry, Oct., 1915.—The hardwood distillation industry in America, by E. H. French, and James R. Withrow, p. 899-900.
- Journal of industrial and engineering chemistry, Nov., 1915.—The chemical engineering of the hardwood distillation industry, by James R. Withrow, p. 912-13; What chemistry has done to aid the utilization of wood, by S. F. Acree,

Barrett's Grade One LIQUID Creosote Oil

Cuts wood preserving bills in half—

For preserving telephone poles, telegraph poles, cross arms, railroad ties, fence posts, mine timbers, underground sills, sleepers, bridge timbers, planking, ice houses, wood tanks, shingles, poultry houses, silos, boat timbers or any exposed woodwork.

Especially adapted for brush and open tank treatment of structural timbers of all kinds.

Booklet on request.

Barrett Manufacturing Co.

New York
Boston
Cincinnati
Detroit
Kansas City
Salt Lake City

Chicago
St. Louis
Pittsburgh
Birmingham
Minneapolis
Seattle
Peoria

Philadelphia
Cleveland



p. 913-15; The tannin content of Pacific Coast conifers, by H. K. Benson, and Thos. G. Thompson, p. 915-16; Yield of by-products from destructive distillation of some western conifers, by H. K. Benson and Marc Darrin, p. 916-18; The use of ammonium hydroxide for the extraction of rosin from wood, by H. K. Benson and Herbert N. Crites, p. 918-20; Discoloration of maple in the kiln, by Roy C. Judd, p. 920; Manufacture of ethyl alcohol from wood waste: 2. The Hydrolysis of white spruce, by F. W. Kressmann, p. 920-2; The manufacture of ethyl alcohol from wood waste: 3. Western larch as a raw material, by F. E. Kressmann, p. 922-3; The application of the Davis spot test in the preliminary examination of creosotes, by Homer Cloukey, p. 923-4; Isoprene from *B-pinene*, by A. W. Schorger and R. Sayre, p. 924-6; The distillation of Douglas fir at high temperatures, by Bailey Tremper, p. 926-7; Waste pine wood utilization, by John E. Teeple, p. 929-30; Contributions of the chemist to the naval stores industry, by John E. Teeple, p. 931-2; Contributions of the chemist to the hardwood distillation industry, by S. W. Katzenstein, p. 940-2; A quantitative method for the determination of the adulteration in Chinese wood oil, by J. C. Brier, p. 953-7; Composition of wood turpentine, by Maxwell Adams, p. 957-60;

Notes on the eucalyptus oil industry of California, by P. W. Tompkins, p. 995-7.
Lumber trade journal, Oct. 1, 1915.—Making yellow dye from the southern osage tree, p. 22.

Paper, Oct. 20, 1915.—Papyrus and paper manufacture, by William Beam, p. 13-14.

Paper, Oct. 27, 1915.—Cellulose cooking systems, p. 17-18.

Paper, Nov. 10, 1915.—A beating test for papermaking fibers, by E. Sutermeister, p. 11-18.

Paper mill, Oct. 9, 1915.—Wood pulp vs. cotton, p. 12, 36.

Paper trade journal, Oct. 7, 1915.—At the Forest products laboratory at Madison, Wis., the experts have succeeded in making wallpaper hangings, p. 18.

Paper trade journal, Oct. 14, 1915.—New economy in the soda process for making wood pulp, by Richard K. Meade, p. 38-40; Pulp wood in Tasmania, p. 48.
Philippine trade review, Sept., 1915.—An up-to-date Philippine lumber concern, p. 11.

Pulp and paper magazine, Oct. 1, 1915.—Evolution of the pulp and paper industry, by Thomas J. Keenan, p. 512-14.

Pulp and paper magazine, Nov. 1, 1915.—The characteristics of fibers, by H. A. Maddox, p. 551-3; Chestnut as a pulp wood, by P. L. Buttrick, p. 554-5; Labrador; its forest wealth and stupendous water powers, p. 560-1.

St. Louis lumberman, Oct. 15, 1915.—Promotion of wood products locally illustrated, by Julius Seidel, p. 47.

Southern lumber journal, Oct. 1, 1915.—Wood, the one economical material for all boxes, by F. C. Gifford, p. 53, 56-7.

Southern lumber journal, Oct. 15, 1915.—The public interest in lumber trade extension, by E. A. Sterling, p. 38-9.

Southern lumberman, Oct. 16, 1915.—Alaskan forests, by Henry Solon Graves, p. 24.

Southern lumberman, Oct. 23, 1915.—Cypress knees and suggestions for their use, p. 55.

Southern lumberman, Oct. 30, 1915.—The kiln drying of lumber, by Harry D. Tiemann, p. 29-30.

Southern lumberman, Nov. 6, 1915.—Forest service officials studying effect of copper fumes on vegetation, p. 27.

Southern lumberman, Nov. 13, 1915.—Forests of Texas, by John H. Foster, p. 36.

Timber trade journal, Oct. 2, 1915.—Methods of timbering in mines, p. 509.

Timberman, Oct. 1915.—United Kingdom market for box shooks, by H. R. MacMillan, p. 28-30; English market for Canadian lumber, by H. R. MacMillan, p. 30-1; Forestry school in China, p. 31-2; French specifications for railway sleepers, p. 33-4; British pole market, by H. R. MacMillan, p. 34; Reforestation in Japan, by Harold C. Huggins, p. 34-5; Oregon pine for Japanese shipbuilding, by E. Carleton Baker, p. 35; Lumber situation in the far east, by Waldemar Toritch, p. 36; Railroad sleeper market in England, by H. R. MacMillan,

BOOKS ON FORESTRY

AMERICAN FORESTRY will publish each month, for the benefit of those who wish books on forestry, a list of titles, authors and prices of such books. These may be ordered through the American Forestry Association, Washington, D. C. Prices are by mail or express prepaid.* :: :: :: ::

FOREST REGULATION—Filibert Roth.....	\$2.00
PRACTICAL TREE REPAIR—By Elbert Peets.....	2.00
THE LUMBER INDUSTRY—By R. S. Kellogg.....	1.10
LUMBER MANUFACTURING ACCOUNTS—By Arthur F. Jones.....	2.10
FOREST VALUATION—By H. H. Chapman.....	2.00
CHINESE FOREST TREES AND TIMBER SUPPLY—By Norman Shaw.....	1.60
TREES, SHRUBS, VINES AND HERBACEOUS PERENNIALS—By John Kirkegaard.....	1.50
TREES AND SHRUBS—By Charles Sprague Sargent—Vol. I and II, 4 Parts to a Volume—per Part.....	5.00
FAGOTS OF CEDAR (Poems and ballads)—By Ivan Swift.....	1.00
THE WOODS—Douglas Malloch.....	1.15
RESAWED FABLES—Douglas Malloch.....	1.15
THE TRAINING OF A FORESTER—Gifford Pinchot.....	1.12
LUMBER AND ITS USES—R. S. Kellogg.....	1.15
THE CARE OF TREES IN LAWN, STREET AND PARK—B. E. Fernow.....	2.17
NORTH AMERICAN TREES—N. L. Britton.....	7.30
KEY TO THE TREES—Collins and Preston.....	1.50
THE FARM WOODLOT—E. G. Cheyney and J. P. Wentling.....	1.70
AMERICAN FOREST TREES—Henry H. Gibson.....	6.00
IDENTIFICATION OF THE ECONOMIC WOODS OF THE UNITED STATES—Samuel J. Record.....	1.25
PLANE SURVEYING—John C. Tracy.....	3.00
FOREST MENSURATION—Henry Solon Graves.....	4.00
THE ECONOMICS OF FORESTRY—B. E. Fernow.....	1.61
FIRST BOOK OF FORESTRY—Filibert Roth.....	1.10
PRACTICAL FORESTRY—A. S. Fuller.....	1.50
PRINCIPLES OF AMERICAN FORESTRY—Samuel B. Green.....	1.50
SEASIDE PLANTING OF TREES AND SHRUBS—Alfred Gaut.....	1.75
FAMILIAR TREES—G. S. Boulger.....	1.50
MANUAL OF THE TREES OF NORTH AMERICA (exclusive of Mexico)—Charles Sprague Sargent.....	6.00
AMERICAN WOODS—Romeyn B. Hough.....	5.00
HANDBOOK OF THE TREES OF THE NORTHERN U. S. AND CANADA, EAST OF THE ROCKY MOUNTAINS—Romeyn B. Hough.....	6.00
GETTING ACQUAINTED WITH THE TREES—J. Horace McFarland.....	1.75
PRINCIPAL SPECIES OF WOOD: THEIR CHARACTERISTIC PROPERTIES—Charles Henry Snow.....	3.50
NORTH AMERICAN FORESTS AND FORESTRY—E. R. Bruncken.....	2.00
HANDBOOK OF TIMBER PRESERVATION—Samuel M. Rowe.....	4.00
TREES OF NEW ENGLAND—L. L. Dame and Henry Brooks.....	1.50
TREES, SHRUBS AND VINES OF THE NORTHEASTERN UNITED STATES—H. E. Parkhurst.....	1.50
TREES—H. Marshall Ward.....	1.50
OUR NATIONAL PARKS—John Muir.....	1.91
THE LONGLEAF PINE IN VIRGIN FOREST—G. Frederick Schwarz.....	.75
LOGGING—Ralph C. Bryant.....	3.50
THE IMPORTANT TIMBER TREES OF THE UNITED STATES—S. B. Elliott.....	2.50
FORESTRY IN NEW ENGLAND—Ralph C. Hawley and Austin F. Hawes.....	3.50
THE PRINCIPLES OF HANDLING WOODLANDS—Henry Solon Graves.....	1.50
SHADE TREES IN TOWNS AND CITIES—William Solotaroff.....	3.00
THE TREE GUIDE—By Julia Ellen Rogers.....	1.00
FOREST PHYSIOGRAPHY—By Isaiah Bowman.....	5.00
MANUAL FOR NORTHERN WOODSMEN—Austin Cary.....	2.12
FARM FORESTRY—Alfred Akerman.....	.57
THE THEORY AND PRACTICE OF WORKING PLANS (in forest organization)—A. B. Recknagel.....	2.10
ELEMENTS OF FORESTRY—F. F. Moon and N. C. Brown.....	2.20
MECHANICAL PROPERTIES OF WOOD—Samuel J. Record.....	1.75
STUDIES OF TREES—J. J. Levison.....	1.75
TREE PRUNING—A. Des Cars.....	.65
THE PRESERVATION OF STRUCTURAL TIMBER—Howard F. Weiss.....	3.00
THE PRACTICAL LUMBERMAN—By Bernard Brereton (third edition).....	1.50

* This, of course, is not a complete list, but we shall be glad to add to it any books on forestry or related subjects upon request.—Editor.

p. 46-7; Cost reporting in sawmills, by Howard B. Oakleaf, p. 50-51; Locating and building logging roads, by Edward P. Scanlan, p. 52.

United States daily consular report, Oct. 16, 1915.—Paraguayan woods containing tannin, by Samuel Hamilton Wiley, p. 236.

United States daily consular report, Oct. 25, 1915.—New fibers for paper making, by W. Henry Robertson, p. 360-1; Tanning materials in Brazil, by Alfred L. Gottschalk, p. 363; American lumber used in Portugal, by W. L. Lowrie, p. 368.

United States daily consular report, Oct. 26, 1915.—Use of veneers in Brazil, by A. L. Moreau Gottschalk, p. 378-9.

United States daily consular report, Oct. 29, 1915.—Tanning materials in South Africa, by Eugene M. Lamb, p. 428-9.

United States daily consular report, Nov. 1, 1915.—British Columbia advertises its timber, by G. C. Woodward, p. 455-7.

Wood turning, Nov., 1915.—Many uses of wood: hickory, maple, cypress, p. 16-17. Wood-worker, Oct., 1915.—Drying oak and other hardwoods, by E. W. G., p. 37.

Forest journals

Allgemeine forst- und jagd-zeitung, March, 1915.—Bernhard Borggreves stellung und bedeutung in der forstwissenschaft, by H. Martin, p. 67-71.

Arborea, Aug., 1915.—The Lancaster elm, p. 101; Ten years of municipal tree planting, by Carl Bannwart, p. 104-6.

Canadian forestry journal, Oct., 1915.—How the permit system works in British Columbia, by M. A. Grainger, p. 215-16; The pine forest at Oka, p. 217-19; Rights of shade trees, p. 219-22; What the forests mean to the municipalities, by F. C. Whitman, p. 227-9, 238.

Forest leaves, Oct., 1915.—Deciduous forests: an ecologic and geographic study, by John W. Harshberger, p. 68-70; The forest fire war college, by Robert G. Conklin, p. 70-1; Protection from forest fires, by F. L. Bitler, p. 71-2; Caledonia state forest fire organization, by Robert G. Conklin, p. 72-3; A blazed trail in the domain of forestry, by S. B. Elliott, p. 73-8.

Forstwissenschaftliches centralblatt, June, 1915.—Die erzeugung vollwertigen holzes im walde, by Karl Eduard Ney, p. 245-56; Die bedeutung der bodenkolloide für die forst- und landwirtschaft, by P. Rohland, p. 257-63; Ueber schematisch vereinfachte hochwaldbetriebspläne, by Hemmann, p. 263-70; Zum anbau der Douglasie, p. 284-6; Der zederwald bei Stein-Nürnberg, p. 286-7.

Forstwissenschaftliches centralblatt, July, 1915.—Die bayrischen waldbauschulen, by Fürst, p. 293-99; Vom honigpilz, by C. Frömbing, p. 299-304; Bodenuntersuchungen über die rotbuchen-streuversuchsflächen im fortbezirk Philippsburg, by K. Ganter, p. 312-35.

India forester, Aug., 1915.—Sandalwood, by C. C. Wilson, p. 247-51; The monopoly

ADVISORY BOARD

Representing Organizations Affiliated with the American Forestry Association

National Wholesale Lumber Dealers' Association

ROBT. C. LIPPINCOTT, Philadelphia, Pa.
R. L. Sisson, Potsdam, N. Y.
JOHN M. WOODS, Boston, Mass.

Northern Pine Manufacturers' Association

C. A. SMITH, Minneapolis, Minn.
WILLIAM IRVINE, Chippewa Falls, Wis.
J. E. WEYERHAEUSER, St. Paul, Minn.

North Carolina Forestry Association

E. B. WRIGHT, Boardman, N. C.
HUGH MacRAE, Wilmington, N. C.
J. C. SMOOT, North Wilkesboro, N. C.

National Association of Box Manufacturers

B. W. PORTER, Greenfield, Mass.
S. B. ANDERSON, Memphis, Tenn.
ROBT. A. JOHNSON, Minneapolis, Minn.

Carriage Builders' National Association

H. C. McLEAR, Wilmington, Del.
D. T. WILSON, New York
C. A. LANCASTER, South Bend, Ind.

Boston Paper Trade Association

N. M. JONES, Lincoln, Maine
JOHN E. A. HUSSEY, Boston, Mass.
ARTHUR L. HOBSON, Boston, Mass.

Philadelphia Wholesale Lumber Dealers' Ass'n

ROBT. C. LIPPINCOTT, Philadelphia, Pa.
J. RANDALL WILLIAMS, JR., Philadelphia, Pa.
FRED'K S. UNDERHILL, Philadelphia, Pa.

New Hampshire Timberland Owners' Association

W. H. BUNDY, Boston, Mass.
EVERETT E. AMEY, Portland, Me.
F. H. BILLARD, Berlin, New Hampshire

Massachusetts Forestry Association

NATHANIEL T. KIDDER, Milton, Mass.
FREDERIC J. CAULKINS, Boston, Mass.
HARRIS A. REYNOLDS, Cambridge, Mass.

Lumbermen's Exchange

J. RANDALL WILLIAMS, JR., Philadelphia, Pa.
FREDERICK S. UNDERHILL, Philadelphia, Pa.
ROBERT C. LIPPINCOTT, Philadelphia, Pa.

Camp Fire Club of America

WILLIAM B. GREELEY
O. H. VAN NORDEN, New York
FREDERICK K. VREELAND, New York

Empire State Forest Products Association

FERRIS J. MEIGS, New York City
RUFUS L. Sisson, Potsdam, N. Y.
W. L. SYKES, Buffalo, N. Y.

California Forest Protective Association

MILES STANDISH, San Francisco, Cal.
GEO. X. WENDLING, San Francisco, Cal.
GEO. H. RHODES, San Francisco, Cal.

Minnesota Forestry Association

W. T. COX, St. Paul, Minn.
PROF. D. LANGE, St. Paul, Minn.
MRS. CARRIE BACKUS, St. Paul, Minn.

American Wood Preservers' Association

J. H. WATERMAN, GALESBURG, Ill.
H. S. LOUD, New York City
F. J. ANGLIER, Baltimore, Md.

Southern Pine Association

J. B. WHITE, Kansas City, Mo.
J. E. RHODES, New Orleans, La.
E. A. STERLING, Philadelphia, Pa.



FURS

Get "More Money" for your Foxes

MUSKRAT, SKUNK, RACCOON, BEAVER, COYOTES, BEAR, LINX and other Fur bearers collected in your section

SHIP YOUR FURS DIRECT to "SHUBERT" the largest house in the World dealing exclusively in NORTH AMERICAN RAW FURS a reliable—responsible—safe Fur House with an unblemished reputation existing for "more than a third of a century," a long successful record of sending Fur Shippers prompt, SATISFACTORY AND PROFITABLE returns. Write for "The Shubert Shipper," the only reliable, accurate market report and price list published.

Write for it—NOW—it's FREE

A. B. SHUBERT, Inc. 25-27 WEST AUSTIN AVE. Dept. 47 CHICAGO, U.S.A.

"THE BEST MADE"



HIGH GRADE PRINTING PAPERS

DILL & COLLINS Co., Papermakers

PHILADELPHIA

Correspondence Solicited

Use Press Clippings

IT will more than pay you to secure our extensive service, covering all subjects, such as Polo, Golf, Tennis, trade and personal, and receive the benefit of the best and most systematic reading of all papers and periodicals, here and abroad, at minimum cost. Why miss taking advantage for obtaining the best possible service in your line?

Our service is taken by all progressive business men, publishers, authors, collectors, etc., and is the card index for securing what you want and need, as every article of interest is at your daily command.

Write for terms; or send your order for 100 clippings at \$5, or 1,000 clippings at \$35. Special rates quoted on Large Orders.

The Manhattan Press Clipping Bureau

ARTHUR CASSOT, Proprietor Established 1885

6 East 41st Street, NEW YORK

Send for Our Desk Calendar

and royalty system of sale, and its application in the Ramnagar forest division, U. P., by S. D. Ranade, p. 251-8; The camphor content of Cinnamomum camphora grown at Dehra Dun, by Puran Singh, p. 291-4; Notes on some Indian forest beetles, by C. F. C. Beeson, p. 294-9.

Indian forester, Sept., 1915.—The Jand (*Prosopis spicigera*) forests of the Punjab, by B. O. Coventry, p. 307-15; Teak floating in Lower Burma in the dry weather, by A. Rodger, p. 315-17; *Ips longifolia* as a pest of Chir regeneration areas, by C. F. C. Beeson, p. 317-25; The pencil-making industry, p. 345-9.

Quarterly journal of forestry, Oct., 1915.—The disposition of the leaves on the lateral shoots of the flat-leaved spruces, by A. D. Richardson, p. 265-73; Forestry in Hampshire and Dorset, by P. Trentham Maw, p. 273-83; Railway rates on timber, by J. W. Mackay, p. 283-98; Surface caterpillars, by Somerville, p. 298-300; Average returns from the afforestation of waste lands, by P. Trentham Maw, p. 326-31; The present condition of the home timber trade, p. 332-42.

Tree talk, Nov., 1915.—A famous sycamore, by F. A. Bartlett, p. 41-2; A dangerous pine sawfly, by W. E. Britton, p. 45-6; A large and sturdy tree family, p. 47-50; The English walnut, p. 51-3; Selecting trees for street use, by Henry R. Francis, p. 59.

Start the New Year Right

A few words to your
best friend about the
American Forestry
Association and its
work will

Gain a Member

Help to double our
membership and you
will aid in doubling
the Association's
power in the cause
of forest conservation

COPLEY- PLAZA HOTEL

BOSTON, MASSACHUSETTS

Official headquarters for the
annual meeting of the Amer-
ican Forestry Association,
January 17 and 18, 1916.

Located on Copley Square
but a block from the Hunt-
ington Avenue and Back
Bay Railroad Stations and
only a few minutes walk
from the down town busi-
ness, theatre and shopping
centers.

Room Tariff

Single Room with Bath
\$3.00 to \$5.00 per day

Double Room with Bath
\$5.00 to \$8.00 per day

EDWARD C. FOGG
Managing Director

*Hotel Breslin, New York City, Under
Same Directorate*

We Specialize in

White Ash Lumber

Both for Export and
Domestic Consumption

*Inquiries will receive
prompt attention*

DUDLEY LUMBER COMPANY, Inc.

Yards:

Memphis, Tenn. New Orleans, La.

PARK and ESTATE FORESTRY

Logging Reports Utilization Studies
Timber Estimates Forest Planting
Etc.

*Methods and Cost of Mosquito
Eradication*

P. L. BUTTRICK
Forester and Mosquito Expert
P. O. Box 607 New Haven, Conn.

Reducing the Cost of Upkeep—

THE INSTALLATION of

L. C. Smith & Bros. Typewriters

is invariably followed by the discovery that
the bills for ribbons are much less than before.
A large corporation recently found that its
ribbon expense was cut in two. This is not
an accident. It is the result of the mechanical
construction that makes the L. C. Smith &
Bros. cheapest to maintain.

The ball bearings give light touch and elimi-

DEMONSTRATION FOR THE ASKING

L. C. SMITH & BROS. TYPEWRITER CO., Home Office and Factory, SYRACUSE, N.Y.
Branches in All Principal Cities 14th and H Streets, N. W., Washington, D.C.



Ball Bearing; Long Wearing

nate pounding impact. The ribbon is actu-
ated by the carriage, not the typebar. The
ribbon mechanism is automatic, so that the
ribbon reverses at the instant the end is
reached and without added strain.

Low ribbon cost, low cost of maintenance
and the highest efficiency—these are guaran-
teed to L. C. Smith & Bros. users.

KELSEY TREE SERVICE

MORE EFFICIENT

MORE RELIABLE

FORESTRY STOCK Ask for our Special Advance Order Prices on Little Trees—seedlings and transplants in Evergreen and Deciduous Stock, all the varieties used for Forestry purposes—healthy, sturdy plants that flourish. Buy now for Spring Delivery. Large stocks mean low prices. Send us your List for Special Quotation.

SHADE TREES Our Stock for Street and Park Planting is specially selected for effective planting results. Trees that please—Maples, Planes, Elms, Lindens, etc.—the kind we have for many years furnished to the leading Park Departments, Shade Tree Commissions, Civic Improvement Committees and other State and Municipal Departments. Send your list of Spring, 1916, Requirements now for Special Advance Order Quotation.

EVERYTHING WORTH PLANTING

Our Service covers the furnishing of everything in Hardy Stock—Evergreens, Shrubs, Vines, Herbaceous Plants, Rhododendrons, etc.—all of the Kelsey Superior Quality.

**F. W. Kelsey Nursery Co., 150 Broadway
NEW YORK**

You Can Save That Tree



By using
**HOYT'S
TREE REPAIR
MATERIALS**

The only correct way of filling tree cavities is by the Asphalt Briquette Method and the Use of Antiseptic Tree Varnish. Write for free folders on tree repair.

C. H. HOYT
410 Citizens Building Cleveland, Ohio

FO 1 RE 2 ST 3 RY 4

The FOREST is three-fourths of FORESTRY

Your opportunities are as unlimited as our forests if you study at

WYMAN'S SCHOOL OF THE WOODS
Incorporated Munising, Michigan

Relative Values

¶ A beautiful house on a bare plot loses caste. It lacks a natural setting.

¶ Nature requires time to remedy it.

¶ By setting out grown trees and shrubs you can

SAVE TEN YEARS

and enjoy a well-shaded harmonious home at once.

Send for our booklet
"Home Landscape"

ISAAC HICKS & SON
Westbury .. Nassau County .. New York

HILL'S

Seedlings and Transplants

Also Tree Seeds

FOR REFORESTING

BEST for over a half century. All leading hardy sorts, grown in immense quantities. Prices lowest. Quality highest. Forest Planter's Guide, also price lists are free. Write today and mention this magazine.

THE D. HILL NURSERY CO.

*Evergreen Specialists
Largest Growers in America*

BOX 501

DUNDEE, ILL.

Evergreen

"We Raise
Our Own
Trees"



Seedlings, Transplants

From our specialized collection of young conifers you will find what you want for every place and purpose. Our stock is hardy and field grown and admirably adapted for forest planting and lining out.

Your order will have personal attention and the price will be right.

Send for catalog and save money

The North-Eastern Forestry Co.

Tree Seeds, Nursery Stock
Box A, Cheshire, Connecticut

ORCHIDS

We are specialists in Orchids, we collect, import, grow, sell and export this class of plants exclusively.

Our illustrated and descriptive catalogue of Orchids may be had on application. Also special lists of freshly imported unestablished Orchids.

LAGER & HURRELL

SUMMIT, N. J.

Orchid Growers and Importers

Seeds for Forestry Purposes

We offer a most complete list of both Deciduous and Evergreen Tree and shrub seeds for forestry purposes.

**Seeds That Are of Best
Germinating Quality**

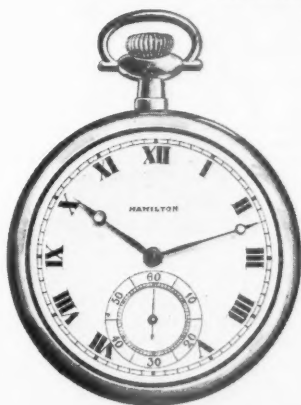
Our catalogue contains a full list of the varieties we offer, which include the best and most rare species. Send for a copy, it will interest you.

THOMAS MEEHAN & SONS

Wholesale Nurserymen and Tree Seedmen
DRESHER, PENNA., U. S. A.

Hamilton Watch

"The Watch of Railroad Accuracy"



IT is policy to buy a good watch. The owner of a Hamilton is practically insured against needing a new watch, or against having a watch that is always in need of repairs.

When you buy a Hamilton, you buy the accurate, durable watch that will tell you true time year after year.

PRICES OF HAMILTONS: The lowest-priced Hamilton is a movement alone for \$12.25 (\$13.00 in Canada). The highest-priced Hamilton is our Masterpiece at \$150.00 in 18 k. heavy gold case. Other Hamiltons at \$15.00, \$25.00, \$28.00, \$40.00, \$55.00, \$80.00, \$110.00, etc. All have Hamilton Accuracy, Beauty, and Durability.

Write for the Hamilton Watch Book
"The Timekeeper"

It's an interesting book on watches. It pictures and intimately describes the various Hamilton models for men and women.

HAMILTON WATCH COMPANY
Dept. 39 Lancaster, Pennsylvania



HIGHEST QUALITY LOWEST PRICES QUICK SERVICE

Submit your Engraving propositions to us for suggestions and prices if you want to **SAVE TIME and MONEY**

NATIONAL ENG. CO. INC.

DESIGNERS-ENGRAVERS

508 14th STREET N.W.

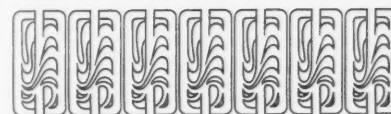
WASHINGTON, D. C.

WRITE

CALL

TELEPHONE

MAIN 8274



Expert Service

*Is Demanded
by Modern
Business
Methods*

S. B. Detwiler

FOREST ENGINEER

Commercial Trust Bldg.
PHILADELPHIA, PA.

Forest Engineering

is expert service in the application of scientific and economic engineering knowledge and experience to forests and their products. It is essential to modern timberland ownership and operation, and equally important to the distributor and consumer of wood.

The Field Covers

*Technical Advice and
Practical Service*

in acquiring, estimating and mapping timber; in making valuations; in management; in selling either the stumpage or manufactured product; in selecting grades or kinds to meet your service requirements; and in preservative treatment to prevent decay.

JAMES W. SEWALL

Timber Estimates

Topographic and Boundary Surveys, Planting, Logging Maps, Portable Mill Operations

Technical Training Thoroughness Experience

CENTRE STREET

OLD TOWN, MAINE



TIMBER ESTIMATES, FOREST
SURVEYS and MAPS

D. E. LAUDERBURN

Forest Engineer

1233 Presbyterian Building, New York City

FORESTERS ATTENTION

AMERICAN FORESTRY will print free of charge in this column advertisements of foresters wanting positions, or of persons having employment to offer foresters

OPPORTUNITY—For a technical and practical forester who has had some experience in teaching. Address, Box 28, care AMERICAN FORESTRY, Washington, D. C.

GRADUATED Danish Forester, with nine years' experience, since graduation, in nursery, planting, reforestation and thinning, also in road-building and logging operation, in Denmark, Germany, India and Canada. Highest references as to ability and character. Permanent position wanted with railroad company, private estate, or timber company. At present employed in Government service. Address, A. B., care AMERICAN FORESTRY, Washington, D. C.

WANTED—Position as City Forester or Park Superintendent by graduate forester, experienced in municipal and private forestry work. Presently employed as Assistant Forester in city with population of 147,000. Address, Box 29, care AMERICAN FORESTRY.

TREE SURGEON, with four years' practical experience, wishes position on private estate or with reliable company. Expert on shade tree work and orchard rejuvenation. Conscientious and efficient workmanship. References. Address H. E. W., care AMERICAN FORESTRY.

DESIRED—a position with a railroad, lumber or paper company by a civil engineer and forester with six years of technical training and nine years of practical work as woods superintendent and forest engineer. Address Box 27, care of AMERICAN FORESTRY.

GRADUATE FORESTER, in 1911, from a recognized eastern college. Four years' experience. One year each in Federal and Pennsylvania State Forest Service. One year with Forest Engineering firm, and one year in Municipal Forestry and Arboricultural work. Am prepared and fully equipped for contract or job work, also permanent or temporary position on private estate, with a city or corporation anywhere in the United States and at all times. Work includes cruising, mapping, reforestation, thinning, damage appraisals, logging and fire protection plans. Municipal and Park work such as pruning, planting, designing and reinforcing and repairing defective, decayed and diseased trees. Address Box G, care of AMERICAN FORESTRY, Washington, D. C.

WANTED—Employment in Forestry Service or with private lumbering firm. Preferably with the Engineer force. Degree of A.B., Hamilton, N. Y. Several years' experience in field and office. Address Box 10, care AMERICAN FORESTRY, Washington, D. C.

PRIVATE ESTATE MANAGER—Position wanted by a man of extensive practical experience in, and thorough scientific knowledge of, ALL departments of private estate management, including forestry. Has just completed the reforestation of an estate for which nearly half a million trees have been used. A permanent position desired upon an estate where the best possible results and economical management will be appreciated. Address Box 25, care AMERICAN FORESTRY.

FORESTER—Graduate Yale Forest School, wishes position in New England or Middle Atlantic States. Good executive ability and commercial training. Four years' experience in United States Forest Service; first class record in timber cruising, surveying, nursery and general administrative work. Address Box 26, care AMERICAN FORESTRY, Washington, D. C.

PRACTICAL WOODSMAN AND FOREST ENGINEER with thorough experience this country and Europe will take charge of forested estate or game preserve. An expert in managing and improving woodlands, and can show results. Highest references as to character, training, and ability. Address Woods Superintendent, Care AMERICAN FORESTRY MAGAZINE, Washington, D. C.

WANTED—A live, hustling man to represent us in Tree Surgery and Forestry work. Must be familiar with shade trees. A college education not essential but must be able to meet and talk with men. New England men preferred, but will consider others. Address Box 3, Care AMERICAN FORESTRY, Washington, D. C.

POSITION WANTED—Engineer with twelve years' experience in Engineering and Forestry. Expert land surveyor, timber estimator, timberland R. R. location. Experienced in woods operation and good manager of men. Permanent position desired with Timber Company, Railroad Company or Private Estate. At present employed. Address Box 4, care AMERICAN FORESTRY.

YOUNG MAN with thorough training in Arboriculture and Forestry, with experience in Tree Surgery, desires position as assistant city forester, or as tree surgeon with some reliable firm. Address "M. A. C." care of AMERICAN FORESTRY.

POSITION WANTED—Am graduate of Biltmore Forest School, with good record in survey, estimate and estate management and want position where I will have a chance to learn more. Have done practical work outside of school and am considered good at timber. Willing to go anywhere and be generally useful. Hard worker, don't mind long hours. Age, 26. Give me interview or let me send references. Address Box 11, care AMERICAN FORESTRY.

FORESTER wants position with Consulting Forestry firm, or with lumber company or private estate. Training from Michigan Agricultural College and Yale Forest School; four years' experience with U. S. Forest Service and two winters with lumber companies. Acquainted thoroughly with Montana, Idaho and California timber as cruiser. References on request. Address Box 17, care AMERICAN FORESTRY.

ENERGETIC Post Graduate Forester desires position as an assistant in park or city forestry work. Subordinate duties preferred. Best of references. Address Box 18, care of AMERICAN FORESTRY.

Graduate of Forestry School, having studied forestry and lumbering operations in this country and Germany, with experience in the U. S. Forest Service, and also in state and private nursery work, would like position with forest engineering firm or lumber company. Best of references. Address Box 19, care of AMERICAN FORESTRY.

WANTED—Position as City Forester or Park Superintendent. Willing to consider position as an assistant. University training; experience in forestry, nursery and landscape work. Twenty-seven years old and married. Best of references. Address Box 20, care of AMERICAN FORESTRY, Washington, D. C.

WANTED—Timber estimating by postgraduate forester with experience in Eastern Canada and Lake States. References. Address Box 21, care of AMERICAN FORESTRY, Washington, D. C.

SCALER—With actual experience desires position with any lumber company in the United States or Canada. Competent surveyor and mapper, accustomed to roughing it. Present employer best reference. Address "Scaler," care of AMERICAN FORESTRY.

WANTED—Position by graduate forester. Experience in Southern Pineeries; five years technical training. Prefers South but willing to go anywhere. Address Box 22, care of AMERICAN FORESTRY.

FOR SALE

OWNER OF 200 MILLION WELL LOCATED

British Columbia Timber, finding it too heavy to carry, will dispose of half interest to party who will pay annual carrying charges. Land surveyed and cruised, guaranteed. Perpetual lease, carrying charges and crown dues definitely set by law and not subject to whim of tax assessor or politicians. Present owner practical timber man. Unequaled opportunity that will show more than 100 per cent profit per annum on ten year pull. Requires \$2,700 per annum. Address D. H. TELFORD, Swift Current, Saskatchewan.

NEW ZEALAND FOREST AREA FOR SALE

An opportunity to secure the cutting rights on over 180,000 acres, timber accessible and easily worked; 40,000 acres averaging over 35,000 feet per acre. Whole tract a total of over 1,600,000,000 feet of first-class hard and soft woods. Inspection by expert cruisers is solicited. For further particulars apply to Box 100, care of AMERICAN FORESTRY, Washington, D. C.

30,000 selected WHITE and CHESTNUT OAK trees, 15,000 selected ASH trees, on 5,000 acres in the State of Virginia, estimated to cut more than 30,000,000 FEET. Balance of timber on this land can be bought cheap. Price of the selected trees, \$2.50 each. This is the greatest bargain we have ever heard of. 6-11. GEORGE J. PHILP, Oil City, Pa.

National Forest Timber Sales

LUMBERMEN have bought National Forest stumpage in preference to acquiring privately owned timber for an operation because of the desirability of working under a Government contract. They have not found the requirements of the Forest Service impractical or burdensome. An important factor is that National Forest stumpage is paid for only as it is cut—no heavy initial investment in timber is required.

Among the sales made by the Forest Service from July 1, 1913, to June 30, 1915, were:

26,650,000 feet in Oregon.
28,300,000 feet in California.
33,667,000 feet in Alaska.
40,050,000 feet in Washington.
66,200,000 feet in Idaho.
75,000,000 feet in Arizona.
80,000,000 feet in Montana.
85,000,000 feet in Montana.
102,802,000 feet in Washington.
117,000,000 feet in New Mexico.
120,000,000 feet in Oregon.
125,000,000 feet in Wyoming.
153,000,000 feet in South Dakota.
177,900,000 feet in Idaho.
382,050,000 feet in Oregon.
43,000 cords in Washington.

Many smaller sales were made during the same period. Tracts are being advertised from time to time, and numerous opportunities for operators are available. You can obtain definite information regarding these opportunities by addressing any of the following offices of the

FOREST SERVICE

WASHINGTON, D. C.

MISSOULA, MONT.

DENVER, COLO.

ALBUQUERQUE, N. M.

OGDEN, UTAH

SAF FRANCISCO, CAL.

PORTLAND, ORE.

*In the National Forest Region***Colorado
School of Forestry**A DEPARTMENT OF
COLORADO COLLEGE

THE course in theoretical and applied forestry leading to the degree of Forest Engineer covers a period of two years and is open to students who have completed two years of college work, including a sufficient amount of Botany, Geology and Surveying.

Graduate students may enter as candidates for the degree of Master of Forestry.

Fall and Spring Terms in the Manitou Forest, the College Reserve, 6,000 acres of pine and spruce timberland on the borders of the Pike National Forest. Winter Term at Colorado Springs.

For particulars address
Colorado School of Forestry
Colorado Springs, Colo.

**The
New York State
College of
Forestry**

at

**Syracuse University
Syracuse, N. Y.**

Undergraduate courses leading to degree of Bachelor of Science; Post-graduate course to Master of Forestry. One year Ranger Course on the College Forest of 1,800 acres at Wanakena in the Adirondacks. August Forest Camp on Raquette Lake open to any man interested in Forestry. The State Forest Experiment Station of 90 acres and excellent Library offer unusual opportunities for research work.

For particulars address
HUGH P. BAKER, D. Oec., Dean

DEPARTMENT OF FORESTRY

**The
Pennsylvania State
College**

A PROFESSIONAL course in Forestry, covering four years of college work, leading to the degree of Bachelor of Science in Forestry.

Thorough and practical training for Government, State, Municipal and private forestry.

Four months are spent in camp in the woods in forest work.

Graduates who wish to specialize along particular lines are admitted to the "graduate forest schools" as candidates for the degree of Master of Forestry on the successful completion of one year's work.

For further information address

Department of Forestry
Pennsylvania State College
State College, Pa.

**Georgia State
Forest School**UNIVERSITY
OF GEORGIA

COMPLETE four-year undergraduate course in theoretical and applied forestry leading to the degree:

Bachelor of Science in Forestry

Wide range of specialization offered—

Logging Engineering
Commercial Administration
Forest Management
City Forestry
Dendrology
State Forestry
Research

Provision for four months' field work—two following each of Freshman and Sophomore years—on McHatten Forest, a large forest estate in the Blue Ridge Mountains. Numerous excursions in Dendrology and Logging. Provision for practical work in specialization during Junior-Senior vacation.

For announcement address

FOREST SCHOOL
**Georgia State College of
Agriculture**
ATHENS, GEORGIA

**Yale University
Forest School**

NEW HAVEN, CONN., U. S. A.

YALE University Forest School is a graduate department of Yale University. It is the oldest existing forest school in the United States and exceeds any other in the number of its alumni. A general two-year course leading to the degree of Master of Forestry is offered to graduates of universities, colleges and scientific institutions of high standing and, under exceptional conditions, to men who have had three years of collegiate training, including certain prescribed subjects. Men who are not candidates for the degree may enter the School as special students, for work in any of the subjects offered in the regular course, by submitting evidence that will warrant their taking the work to their own advantage and that of the School. Those who have completed a general course in forestry are admitted for research and advanced work in Dendrology, Silviculture, Forest Management, Forest Technology, and Lumbering. The regular two-year course begins the first week in July at the School camp near Milford, Pennsylvania.

For further information
address

JAMES W. TOUMEY, Director
NEW HAVEN CONNECTICUT

**HARVARD
UNIVERSITY**DEPT. OF FORESTRY
BUSSEY INSTITUTION

OFFERS specialized graduate training leading to the degree of Master of Forestry in the following fields:—Silviculture and Management, Wood Technology, Forest Entomology, Dendrology, and (in cooperation with the Graduate School of Business Administration) the Lumber Business

For further particulars
address

RICHARD T. FISHER
Jamaica Plain, Massachusetts

SPECIAL OFFER

Chinese Forest Trees and Timber Supply

By NORMAN SHAW, B. A.

351 Pages

With a map and 33 illustrations

An economic study of the forest and timber situation in China. Valuable to every forestry student, forestry library and public library.

Published in England and supplied to readers of American Forestry Magazine, postage paid for

\$2.60

Order from
AMERICAN FORESTRY
ASSOCIATION
Washington, D. C.

Bird-Lore

for
Christmas

Tell us to whom you wish to send Bird-Lore during 1916, and we will mail them a beautiful, colored Christmas Card, signed with your name as donor, and a free copy of our 125 page Christmas number in time to be received on Christmas Day, while Bird-Lore, with its over 500 pages and 12 colored plates, will follow throughout the year.

Annual subscription \$1.00, for Christmas five subscriptions for \$4.00, three for \$2.50.

D. Appleton & Company
29 West 32d Street
New York City

TIMBER CRUISING BOOKLETS

BILTMORE TIMBER TABLES

Including solution of problems in forest finance.

SOUTHERN TIMBER TABLES

How to estimate Southern Pine, Southern White Cedar, and Southern Appalachian Timber—Spruce pulpwood, Hemlock bark, Chestnut oak bark, Chestnut tannic acid wood.

Postpaid, 25 cents each

HOWARD R. KRINBILL
Forest Engineer Newburn, N. C.

Handbook of Trees

By ROMEYN B. HOUGH

\$6.00

A book which will enable you to identify trees without a knowledge of botany

American Woods

By ROMEYN B. HOUGH

\$5.00

A Volume

Order from
AMERICAN
FORESTRY ASSOCIATION
Washington, D. C.



A LESSON IN CAUTION

He was a veteran woodsman. In his belt just in front of his right thigh he carried a large hunting knife in a leather sheath. Evidently he had left the trail and sat down upon a log to rest; as he did so the knife penetrated the large artery (femoral) in the thigh and he bled to death in three minutes. His body was found in this position a month later.

There's a lesson in caution for all campers to be learned from this sad experience. No matter how woods wise we are there is always an opportunity to learn more.

THE CAMPER'S LIBRARY

Has been carefully selected for this very purpose from a list of several hundred letters. There are seven books, each complete, each written by an expert. Each fits the pocket for ready reference or the book shelf for future consultation.

The titles are:—

Camp Cookery Backwoods Surgery and Medicine
Packing and Portaging Taxidermy
Tracks and Tracking Winter Camping
The Canoe, its selection, care and use

There is a wonderful fund of information in this library for the beginner and expert alike.

SEND NO MONEY

This offer, which also includes a year's subscription to OUTING, is subject to your approval. If you are not satisfied, return the books at our expense.

SIMPLY MAIL THE COUPON BELOW



OUTING PUBLISHING CO.,
141 West 36th Street, New York.

Send me prepaid on approval your Camper's Own Library of 7 volumes uniformly bound in green cloth, also the Outing magazine for twelve months. If I keep the books I will remit \$1.00 a month for 7 months for the books and magazine. Otherwise, I will return the books within ten days at your expense and my subscription to Outing will be cancelled. If it is more convenient to pay in one amount, you may remit \$6.00.

Name.....

Address.....

History of Forestry

By B. E. FERNOW
Dean of Forestry
University of Toronto

A book every student of Forestry should buy and without which no forest library is complete.

506 pages, 8vo
Price, \$2.50, postpaid

American Forestry Association
Washington, D. C.



WE MAKE THE ENGRAVINGS

FOR THE
AMERICAN FORESTRY
MAGAZINE

OUR SPECIALTY
IS THE "BETTER GRADE FINISH OF
DESIGNS & ENGRAVINGS
IN ONE OR MORE COLORS
FOR MAGAZINE CATALOGUES
ADVERTISEMENTS ETC

HALF TONES LINE PLATES
DULLO-TONES COMBINATION LINE
COLOR PROCESS MULTI-COLORS

—ESTABLISHED 1889—
GATCHEL & MANNING
SIXTH AND CHESTNUT STREETS
OPPOSITE OLDE INDEPENDENCE HALL
PHILADELPHIA

